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The ILLINOIS Medical Journal

VOL. 82 NO. 2

August, 1942

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Esophageal Diverticulum

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OFFICIAL JOURNAL OF THE ILLINOIS STATE MEDICAL SOCIETY

Wyeth's
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ALULOTION AMMONIATED MERCURY WITH KAOLIN FOR IMPETIGO

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*J. M. Soc. New Jersey, 36, 442 (July) 1939.

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The Illinois Medical Journal

August, 1942

VOL. 82, NO. 2

Official Journal of the Illinois State Medical Society

EDITOR — Harold M. Camp. EDITORIAL BOARD — James H. Hutton, Chairman, Frederick H. Falls, Josiah J. Moore, Edwin M. Miller, Chauncey C. Maher, Harry S. Gradle, Philip H. Krauscher, Harry Culver.

Editorials

"WHO IS ESSENTIAL?"

During the past eight months many physicians have been called to enter the service of our government in this greatest emergency in the history of our country. Many hundreds of Illinois physicians are in service at this time and hundreds more from this state must join the medical corps of the Army or Navy before the end of the present year.

We have been informed that eight states must furnish approximately 80% of the desired medical personnel. The quota for Illinois, one of these eight states, is necessarily high with some 12,200 licensed physicians within the state. The present call is principally for physicians under the age of 45, although some men between the ages of 45 and 55 have been commissioned during recent months. It has been stated frequently that by the end of the present year most of the physically fit physicians of the country under 45 will be in service.

Illinois has four Class A medical schools which must continue to graduate physicians each year. There must be retained in these schools many teachers of recognized ability and some of these on the essential lists, must be under the age of 45. Each of these schools has submitted a list of instructors with statements as to availability or essentiality regarding each. Many of the younger men on the staff rolls of these educational institutions, although formerly considered as essential, have been made available for commissions in the medical corps.

A number of teachers of recognized ability, although considered essential by their respective deans, have insisted that they be released and permitted to enter service. In quite a few instances these requests have been granted.

Especially in larger communities there are a few specialists in certain fields who cannot at the moment, be replaced. These men have been declared essential for perhaps a period of from three to six months.

Likewise in smaller towns with only one physician within draft age, it has been decided that this physician should be declared essential for a few months pending replacement. It may not be possible to leave a physician in every small town, especially where there are other physicians nearby who can give the desired adequate civilian medical care for the duration.

Many industrial concerns have a well organized medical staff to care for employees. In many instances the companies are doing some type of war work. It may not be possible to permit the maintenance of the entire medical personnel of these institutions, although efforts are being made to keep some physicians in their present positions at least until replacements can be made.

There will no doubt be a shortage of physicians in many Illinois communities, yet the

minimum requirement is one physician to each 1,500 inhabitants. There was a situation called to the attention of the Procurement and Assignment Service recently where one county in this state had only eight able bodied physicians to care for more than 20,000 people. It was deemed advisable to recommend that all these physicians for the present at least, be declared essential.

We are informed that in the near future a roster will be prepared of physicians who are either too old for military service or who have been rejected for military service, and are willing to go into a community to take the place of the younger physicians who have joined medical corps. Lists are to be made of physicians who have had industrial training and who can be used in the care of defense workers to release the younger men.

This is an excellent opportunity for women physicians to go into some of these communities needing physicians, and also for interns and residents who have been rejected for military medical service.

Hospitals in Illinois, as elsewhere, are cooperating with the government at this time in reducing their lists of residents and likewise cutting down on their staff memberships to permit younger physicians to enter the medical corps. Long term residencies are being discouraged as a whole, even though the completion of another year or two as a resident may be sufficient to permit approval by one of the National Boards.

Many physicians, formerly residents but now in service, have stated that the services in their present position are equal to if not superior to those in their former capacities. Clinical groups have curtailed their staffs, and in many instances 50% or more of the former staff personnel is now in service. The head of an Illinois clinical group stated recently that he is willing to eliminate the vacations, forget the half day off each week and work a little longer each day during the present emergency, as more than half his group have all ready been commissioned.

Yet it is doubtful if working seven days each

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with no time off is best for the busy physician, who after all does need some rest and relaxation. In some communities where physicians formerly took a certain afternoon off each week, two half days have been selected with a certain group of physicians taking one of these days off, and the others taking the second half day for their relaxation and rest.

It is quite important that physicians today take better care of themselves. As they recommend to their patients, they too should have an occasional periodic examination to see that they are keeping physically fit. A physician-aviator recently stated that he greatly appreciated the opportunity of having his annual physical examination for the renewal of his pilot's license, as otherwise he, like too many others in the medical profession, would not have any physical checkup.

It is quite obvious that during the present emergency, greater responsibilities must fall on the shoulders of the older physicians. Some men who have been practically retired will no doubt assume greater obligations and enlarge their field of usefulness. Many city physicians may be requested to become country practitioners for after all, the real shortage of physicians will be found in the more sparsely settled and rural areas.

Greater demands are being made each month on the physicians of this country. It is the firm belief of those responsible for the operation of the Procurement and Assignment Service that within the coming months, the demands of the government will be cared for completely.

THE HEALTH OF THE ARMY

A recent release from the War Department stated that the health of the army is excellent. During the past winter months there were no serious outbreaks of respiratory infections, and compared with the previous winter there was a reduction of 52% for all diseases, and 70% for respiratory diseases. It was reported that in the late spring and early summer months there were numerous admissions to the hospitals on account of jaundice which apparently was the condition commonly known as catarrhal jaundice or epidemic hepatitis.

The efficient health corps in the armed forces are giving this and all other disease conditions the most careful study and attention. This applies to the soldiers moved into new areas as climatic changes occasionally cause a slight increase in hospitalization during the period of acclimatization.

The medical profession is able to offer more to the armed forces today than during the past war on account of the many recent developments in all branches of medicine. Every soldier is given a small supply of sulfanilimide with instructions as to its use. With the daily increase in the knowledge concerning the uses of "sulfa" group of drugs, hospitalizations are correspondingly decreased.

The intraperitoneal and intravenous methods of administration of these new drugs has been of great advantage in decreasing mortality from many types of infections. The recently developed method of immunization against tetanus will no doubt add much to the protection of the health of the armed forces. Comparatively recent improvements in bone surgery, treatment of osteomyelitis and care of fractures has likewise reduced the hospitalization period and increased the liklihood of complete restoration of function of these parts.

The modern treatment of soft tissue injuries as compared with methods of a quarter of a century ago are worthy of comment at this time. The increased use of soap and water, debridement and modern aftercare greatly reduce the dangers of wound suppuration and the dreaded complications such as tetanus, gangrene, etc.

Burns today are treated in a different manner than that used during World War I. Head injuries are given greater consideration than ever before, and fractures, infections and other injuries to the head cause less permanent damage than those of a few years ago. Bone transplants frequently restore to usefulness, parts which formerly would have been hopelessly disabled.

With the modern treatment of pneumonia and other respiratory tract diseases, there should be fewer complications from these infections as well as a marked reduction in their mortality. Preserved blood and plasma are made available everywhere the troops are sent, and with present day technique in administration, these valuable preparations can be given almost anywhere in complete safety.

The services of research organizations throughout the country are made available to the armed forces, and it is quite likely that within the next year, many additional developments will be added to the long list of recent years and will provide more to protect the health interests of our men in uniform.

It has been stated that the health of the American army is best of all armed forces, and with the thousands of physicians now in service and many additional thousands to be added during the coming months, there is every reason to believe that the U. S. Army will receive the best medical care to be found in the field.

TELLS OF SIMPLE WAY TO TREAT NAIL PUNCTURE WOUNDS OF FOOT

Method Described By Navy Surgeon Avoids Probing, Laying Open, Drainage And The Injection Of An Antiseptic Solution

A simple plan of treatment for nail puncture wounds of the foot is described in *The Journal of the American Medical Association* for May 30 by Fred H. Bowen, M. D., Lieutenant (j. g.), U. S. Naval Reserve, New River, N. C., who says that a total of 661 such wounds were treated by the method with no deaths or tetanus.

Pointing out that there is a wide diversity of opinion in medical literature concerning the proper treatment of such wounds of the foot, Dr. Bowen says that "most authors advocate probing the wound, laying it open, injecting an antiseptic solution . . . and instituting some form of drainage. It is my opinion that such treatment is unnecessary, painful and harmful and that it is followed by prolonged disability and at times by a painful . . . scar. Foreign bodies are not often carried deeply into the foot by a nail but they lie in the dermis (skin) or just beneath it. . . ."

He says that he has demonstrated that nails (6 to 20 penny) are wiped clean in the first ¼ inch of the wound.

In dealing with cases of nail puncture wounds incurred by laborers in the construction of the United States Naval Air Station at Jacksonville, Fla., he says, the following simple plan of treatment was used: The foot was soaked for fifteen to thirty minutes in hot water to which liniment of soft soap or a small quantity of a solution of cresol was added. The foot was dried carefully, and an area about 2 to 3 inches in diameter around the wound was painted with tincture of mercresin. The top layer of the skin was cut away around the wound. This exposed the foreign matter (usually sand, rarely particles of sock, leather, rust, rubber or concrete), which could then be easily removed. A dry dressing was applied, and 1,500 units of tetanus antitoxin was given. If the wound was caused by a nail larger than a 10 penny, the patient was told not to work for at least one or two days, but if a nail of lesser diameter was involved he returned at once to work.

STUDY OF BURNS IMPORTANT IN WARTIME

"The study of burns is of especial importance in time of war," Henry N. Harkins, M.D., Detroit, says in *The Journal of the Americal Medical Association* for May 30, pointing out that "It is reported that 60 per cent of the casualties at Pearl Harbor were burns. The treatment of war burns requires an adequate knowledge of the management of peacetime injuries coupled with an understanding of several of the distinguishing features of wartime burns. The present conflict has produced several unusual injuries not previously seen in large numbers, e. g., the "airman's burn," the phosphorus burn and the burn contaminated by oil and sea water. . . ."

The so-called airman's burn, he says, is especially prevalent in this war. When an explosion occurs in an airplane, the aviator throws up his hands to protect his face, burning the backs of the hands as well as the face. Such burns are often deep and involve a considerable amount of convalescent care to prevent bad scarring.

The phosphorus burns are especially apt to occur from incendiary bombs and self-igniting phosphorus grenades. Because small particles tend to become embedded under the skin, these injuries are apt to be deep. It is advised that such burns should be immersed and the phosphorused particles picked out under water.

Dr. Harkins says that general treatment of burns should be carefully coordinated with local treatment. The former should be promptly carried out and should include measures directed against shock, toxemia (poisoning of the blood stream from bacterial products formed at the source of an infection). and infection. Specific remedies include plasma (the liquid portion of the blood), dextrose solution, blood by transfusion, possibly adrenal cortex extract, and sulfonamides.

1st Draftee—"What did the little rabbit say as he ran out of the forest fire?"

2nd Same—"Hooray, I've been defurred."—*Old Maid.*

Correspondence

EIGHTH ANNUAL MEETING MISSISSIPPI VALLEY MEDICAL SOCIETY

The Eighth Annual Meeting of the Mississippi Valley Medical Society, "The Mid-West's Greatest Intensive Post-Graduate Assembly for General Practitioners" will be held in the Hotel Lincoln-Douglas, Quincy, Ill., Sept. 30, Oct. 1, 2. The program will be given by 25 clinician-teachers who will give over 40 lectures, demonstrations, instructional courses, etc. On Sept. 30 there will be a series of instructional courses by Kansas City clinicians and a complimentary Stag supper. On Oct. 1, a group of well-known Chicago teachers will have charge. A special Physicians' Sports Event program will be featured on this date with prizes for golf, skeet, bowling, archery and horse-shoes. The Banquet will be addressed by Dr. Edward H. Cary, of Dallas, Texas, Past President of the American Medical Association, and the Presidents of the Illinois, Iowa and Missouri State Medical Societies. There will be numerous technical and scientific exhibits. Every ethical physician is cordially invited to attend and no registration fee will be charged physicians in the uniform of the armed forces of the United States. The complete program appears in the September issue of MISSISSIPPI VALLEY MEDICAL JOURNAL, and further information may be secured from the Secretary, Harold Swanberg, M. D., W. C. U. Building, Quincy, Ill.

CANCER PROGRAM ENDANGERED

Alarmed by the fact that the armed forces are rapidly siphoning off the doctors especially trained to diagnose and to treat cancer, which is the second highest cause of death in the United States, the American Society for the Control of Cancer is asking Paul V. McNutt, Federal Security Administrator, to "consider prompt investigation and effective action to prevent what may turn out to be a major public health disaster."

Dr. C. C. Little, Managing Director, transmitted the Society's viewpoint to Mr. McNutt in the following letter:

"Our suggestion is that steps should be taken before the ranks of cancer workers are further depleted by their entrance into the Army or Navy, to 'freeze' a number of these men in positions where they can continue to fight this disease. Certain diseases can temporarily be merged in the war program without undue handicap due to our knowledge concerning them. This is not true of cancer. If the men trained to diagnose and treat cancer, and to date largely concerned with it, are all of them taken into the armed forces, the program against the disease will be set back for some ten to twenty years. For this reason, and because cancer kills approximately 158,000 Americans each year, we thought you would be willing to consider prompt investigation and effective action to prevent what may turn out to be a major public health disaster."

THE AMERICAN CONGRESS OF PHYSICAL THERAPY

Will hold its twenty-first annual scientific and clinical session September 9, 10, 11 and 12, 1942 inclusive, at the Hotel William Penn, Pittsburgh, Pa. The annual instruction course will

be held from 8:00 to 10:30 a.m., and from 1:00 to 2 p.m. during the days of September 9, 10 and 11 and will include a round table discussion group from 9:00 to 10:30 a.m., Thursday, September 10. The scientific and clinical sessions will be given on the remaining portions of these days and Saturday morning. A new feature will be an hour demonstration showing technic from 5:00 to 6:00 p. m. during the days of September 9, 10 and 11. All of these sessions and the seminar will be open to the members of the regular medical profession and their qualified aids. For information concerning the seminar and program of the convention proper, address the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

ILLINOIS STATE HEADQUARTERS SELECTIVE SERVICE SYSTEM

DWIGHT H. GREEN, Governor
PAUL G. ARMSTRONG, Director

War Department Circular 147, dated May 16, 1942, follows, in part, and is submitted for your information:

"6a. An Officer of the Army of the United States must at the time of appointment be a citizen of the United States or of the Philippine Islands, or an alien of a co-belligerent or friendly country who otherwise possesses the same qualifications as a citizen of the United States, and between the ages of 18 and 60 years."

Very truly yours,
For the Director
E. Mann Hartlett
Major, M. C.
State Medical Officer

STATE-SPONSORED ILLINOIS CONFERENCE ON PUBLIC HEALTH AND UNOFFICIAL ILLINOIS PUBLIC HEALTH ASSOCIATION

All interested lay and professional Illinois public health workers are invited to attend the annual *Illinois Conference on Public Health*, sponsored by the Illinois Department of Public Health, which will this year be held at 2:30 P. M. on Monday, October 26, in St. Louis, as a joint meeting with the voluntary Illinois Public Health Association. Scheduled as a pre-convention session the day before the opening of the American Public Health Association's annual meeting in St. Louis, the program of the Illinois session will include important talks by Dr. Roland R. Cross, State Director of Public Health, Dr. Henry F. Vaughan, Head, School of Public Health, University of Michigan, and Dr. Huntington Williams, Professor of Hygiene and Public Health, Baltimore City Health Department.

Following this session there will be a special wartime business meeting of the Illinois Public Health Association, with a dinner at 6:30 P.M.

POWER-DIVES ANALYZED

The spiral nose-dive is perhaps the aviatory maneuver for which the advice based on physiologic understanding is of most practical use for the air-force men, because the rotation-speed is so increased that repeatedly there occurs a vertigo which may be very dangerous to the flying man. The rotation in a spiral nose-dive takes place in a horizontally situated frontal plane, as on the revolving-chair if the examined person puts his head on his knees. At the end of the nose-dive the craft is levelled off and the plane of the consequent vertigo is frontal but vertical. Now a fall-reaction will occur in the direction of the just completed rotation. When a pilot comes from a right-hand nose-dive, having sat upright throughout, he will have the tendency to fall to his right side since he has the sensation of turning in a frontal plane to the left, and in reacting to this feeling there is great risk of his making the same movement with his joy-stick and thereby putting his craft again into a right-hand tonneau or roll, which in the confusion of sensations is likely to become another right-handed spiral-dive. It is therefore of great practical importance to prevent this vertical vertigo completely or to change it to a harmless horizontal type. This is a very likely explanation of the appalling frequency of plane-crashes following either intentional or accidental spiral dives by inexperienced pilots.

This dangerous reaction may be prevented by bowing the head 90 degrees forward during the nose-dive, facing the floor of the craft, by which the pilot thus allows only his horizontal semicircular canals to be stimulated. Letting up on the spiral nose-dive if the craft comes from the vertical position into the horizontal plane again he has to sit upright immediately again, by which the stimulated horizontal semicircular canals remain horizontal and the vertigo is accordingly kept innocuous.—*Kurt Fuchs, M.D., The Canadian Medical Association Journal.*

★ BUY WAR BONDS ★

Medical Economics

Edited by R. K. Packard, M.D., Chairman of the Committee on Medical Economics of the Illinois State Medical Society, 826 East 61st Street, Chicago, Illinois.

The House of Delegates of the American Medical Association at the last annual meeting did not take any specific action or stand on the proposed amendment to the Social Security Act for compulsory hospital insurance.

It is proposed under the proposed amendment to the Act, that a cash indemnity in the amount of $3.00 a day for hospitalization would be set up. The American Medical Association previously approved cash indemnity payments for both hospital service and medical service. The question can be raised at the present time that inasmuch as the A.M.A. had previously approved cash indemnity payments, whether there is now any justifiable reason for opposing such an amendment to the Social Security Act. Perhaps the one debatable feature that still exists is that the A.M.A. did not approve any compulsory plan. The whole question of social reform and regimentation thus again presents itself for discussion. The common man long discussed in politics and by reformers, has risen to new heights in our democracy, and there are many who believe that we are just becoming democratic, and that the capitalists and the aristocracy no longer control the destiny of the common man, and that he is coming out of his bondage of economic and social slavery, and developing a true democracy that will render him free from fear and free from want, along with other freedoms that he now enjoys. There is much evidence that this has been for a number of years and is at present a world wide movement, and perhaps it was the main factor in the cause of the present world war. That rapid industrial development created new social and economic problems can not be questioned. Most of us are agreed that in our rapid industrial development there was not an equal social and economic development and reform taking place. It is obvious that we had to have the industrial development first, and that social and economic reforms would of necessity follow. Most of us are agreed that there was and still is definite need for social and economic reform and readjustment. The problem is how can this best be accomplished without dislocating our democracy?

There appears to be at least two ways of approaching the subject. The first would be such reforms and legislation that allow to make it possible for the individual to more adequately help himself through such processes as education and special training, and through the elimination of various forms of rackets that in the past have taken many of his savings from him. Government should assume a definite responsibility along these lines.

The second method of social and economic reform is one of regimentation in which a centralized bureaucracy or military government assumes the responsibility of giving social and economic security through such agencies as the Social Security Board and other legislative acts. It then becomes one of compulsion and taxation and administration by the Government. Some say that such a government is really a government of the people, by the people and for the people, as contrasted to government of the few, by the few and for the few. The world is in a great struggle fighting for something. Most of us are perplexed as to just what we are fighting for, and we are further perplexed as to obtaining those things that we think we are fighting for. Perhaps we shall discuss this question in this column at a later date.

Medicine's Role in the War Effort

QUESTIONS AND ANSWERS ON PROCUREMENT AND ASSIGNMENT SERVICE

Q. Will the Procurement and Assignment Service protect a doctor from the draft?

A. The Procurement and Assignment Service was not established to protect anybody from anything. Its function is to enroll physicians, dentists and veterinarians and assign them to the positions in which their services will be of greatest value to the nation in the war emergency. This function obviously parallels the responsibilities of Selective Service, but the officials of the Selective Service have welcomed the cooperation of the Procurement and Assignment Service in dealing with these professional groups. To implement this cooperation, General Hershey issued a memorandum to Selective Service boards asking them to secure through the state director of Selective Service the recommendations of the Procurement and Assignment Service wherever they are considering the classification of a physician, dentist or veterinarian. Hence, if a doctor has enrolled with the Procurement and Assignment Service, his Selective Service board will be so advised and a recommendation for his deferment, until his services are needed in a professional capacity, will be made.

Q. Will men under 45 be called before men over that age will be considered?

A. The Army will consider applications for commission from men up to the age of 55 and the Navy up to the age of 50. The greatest need, however, is for younger men. Hence, the first call by the Procurement and Assignment Service will be for men under 36 and then men between 36 and 45 years of age.

Q. If a physician is physically disqualified for a commission, is he still subject to the draft?

A. The physical requirements for officers are higher than they are for enlisted men, but under the modified requirements for "limited service" in the Medical Corps most, if not all, physicians who meet the requirements for enlisted men will be eligible for commissions. If not, the physician concerned should consult the chairman of his State Procurement and Assignment Service Committee relative to service in a war industry or some other essential civilian service.

Q. How much consideration will be given to the choices of service listed on the enrolment form of the Procurement and Assignment Service?

A. So far as possible, the choices of service listed on the enrolment form will be given consideration. However, if the needs of the armed forces demand it, it may at times be necessary to ignore personal preferences.

Q. Do physicians in shipbuilding and airplane factories receive any special consideration?

A. Essential medical service in vital war industries must be maintained. To do this, certain medical positions must be declared essential. Individual physicians who are of military age and physically fit for service should be declared essential in such positions only if it is impossible to replace them or have the necessary service provided by men not otherwise available for service with the armed forces.

Q. In determining the number of physicians needed to care for the civilian population, are rural communities considered on the same basis as larger cities?

A. A special committee is now working on the determination of minimum quotas of physicians for civilian medical care. In their studies consideration will be given to the density of the population, the ease of transportation, the availability of hospital service and other factors.

Q. Will doctors in draft age be called by the Procurement and Assignment Service on the basis of availability regardless of their Selective Service numbers?

A. In asking physicians to accept assignments, the Procurement and Assignment Service will select names by chance from alphabetical lists of the names of the physicians in the age group desired. Officials of national headquarters of Selective Service report that it is impossible to use Selective Service order numbers for this purpose. The first lists to be given assignments with the Army or Navy will be those who have

indicated these services as their first choice.

Q. How many people in a community can be served by one man?

A. Studies are in progress by a special committee of the Procurement and Assignment Service to serve as a basis for the determination of minimum quotas of medical service which should be retained for the civilian population. Until these studies are completed it has been agreed that, for general medical service, approximately one "effective" doctor to fifteen hundred population is the minimum coverage that should be provided. Limited specialists are not included in this basic figure.

Q. Is it true that unless an intern for 1942-1943 has a commission in the Army or Navy he may be withdrawn at any time?

A. National headquarters of Selective Service has advised local boards that medical students and interns who wish deferment and are physically enabled should apply for the commissions which are available to them. In view of this, interns who are physically fit and do not hold commissions may be subject to induction.

Q. What percentage of a man's time devoted to medical teaching is necessary to make him essential?

A. The determination as to whether an individual is an essential teacher cannot be put on a percentage basis. Some teachers on a full time basis cannot justifiably be considered essential, while others giving a much smaller proportion of time might be essential. In general, however, very special circumstances should exist to justify designating a physician of military age as an essential teacher unless he is devoting at least half time to teaching.

Q. Is the local draft board or the Procurement and Assignment Service to determine whether a doctor is necessary in his local community?

A. The legal responsibility for deciding whether any individual who is registered with Selective Service shall be given deferment rests with his local Selective Service board. However, General Hershey has directed local boards, when considering the classification of physicians, dentists or veterinarians, to secure the advice of the state committee of the Procurement and Assignment Service as to whether the individual under consideration is "essential" for the care of the civilian population in his community or whether he can be considered available for service elsewhere.

Q. How many physicians are there in the United States under 35 years of age? Under 45?

A. Of the 152,923 physicians in private practice in the continental United States, 37,753, or 24.7 per cent, are under 35 years of age, 35,240, or 23.0 per cent, are 35-44 years of age, 26,573, or 17.4 per cent, are 45-54 years of age, 26,076, or 17.1 per cent, are 55-64 years of age, 11,915, or 7.8 per cent, are 65-69 years of age, 8,112, or 5.3 per cent, are 70-74 years of age and 7,233, or 4.7 per cent, are 75 and over.

Q. Do you expect the needs of the armed forces to be filled by voluntary enlistment? If not, what is to be the procedure?

A. It is the firm conviction of the directing board of the Procurement and Assignment Service that the physicians of this country will willingly accept the assignments requested of them in meeting the medical needs of the nation during the war emergency. The executive order of the President establishing the Procurement and Assignment Service states that Mr. McNutt may "instruct the Agency to draft legislation, which may be necessary to submit to the Congress providing for the involuntary recruitment of medical, dental and veterinary personnel, in the event the exigencies of the national emergency appear to require it." The directing board, however, has given no thought to such legislation because it is convinced that it will not be necessary.

Q. In what grade may a doctor expect to receive a commission?

A. The policy which is being followed by the Office of the Surgeon General of the Army in making recommendations for commission is as follows:

1. All appointments must be limited to the quotas provided for medical personnel of various ranks in relation to the total over-all size of the Army.

2. All appointments in tactical units will be at minimum grades of first lieutenant, as no experience in civilian life qualifies a doctor for service in this capacity.

3. Appointments above the minimum grade will be made only on the basis of vacancies, special qualifications and there being no one qualified to fill the position by a promotion.

First lieutenant.— All appointments under 37 will be in this rank except for individuals who possess special qualifications for a particular vacancy which exists. Certification by specialty board will be considered evidence of such special qualifications. Applicants who previously held appointments in the Medical Reserve Corps in the rank of captain may apply for reappointment at the same rank.

Captain.— Initial appointees at the age of 37-45 may apply for this rank. Likewise, men under 37 with special qualifications.

Major.—Age 37-55. Eligible applicants must have the special qualifications required for appointments as captain and in addition experience and training which qualifies the individual as chief of a service or section, or executive of a large hospital.

Lieutenant Colonel and Colonel.—New appointments will be made in these ranks only for special assignments which cannot be filled by promotion.

Signed for the Board,
PROCUREMENT AND ASSIGNMENT SERVICE,
FRANK H. LAHEY, M.D., Chairman.

"GUIDES TO THERAPY FOR MEDICAL OFFICERS"

A technical manual for medical officers has just been issued by the Government Printing Office in Washington, entitled "Guides to Therapy for Medical Officers." The material on which the text of the manual is based was furnished largely by the various committees and subcommittees of the Division of Medical Sciences of the National Research Council with the assistance of other consultants. A preliminary note gives the names of all various specialists who cooperated in producing this book. The final editing was done by Dr. R. N. Nye of the Committee on Information of the Division of Medical Sciences of the National Research Council. The book is divided into seven sections, covering a general consideration, surgical emergencies, medical emergencies, diagnosis and treatment of venereal diseases, chemoptherapy and serotherapy in certain infectious diseases, treatment and control of certain tropical diseases, and the rickettsial diseases. Here in outline form is a compilation of the very latest information available on the subjects discussed as standardized for use under Army conditions. The book constitutes, therefore, an invaluable reference work for the Army medical officer and will be found most valuable by any physician under any circumstances. Copies of the book are available from the Superintendent of Documents, Washington, D. C. The price is 25 cents.

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GRADUATES IN AVIATION MEDICINE UNDER NEW SYSTEM OF TRAINING

The course of instruction in aviation medicine for aviation medical examiners is now divided into two parts, the didactic portion being conducted at one field and the practical portion at three army air forces classification centers. The first class to graduate under this new system of training was graduated on July 2. Appropriate exercises were held in each of the centers. The list of graduates from Illinois are:

Donald W. Anderson, 1st Lieut., Chicago.
Leon J. Armalavage, 1st Lieut., Chicago.
Robert E. Bowen, 1st Lieut., Chicago.
Milton J. Loring, 1st Lieut., Chicago.
Robert J. Stephen, 1st Lieut., Joliet.
Anthony J. Sweeney, 1st Lieut., Chicago.

ILLINOIS CONFERENCE ON NUTRITION FOR DEFENSE

The Illinois Nutrition Committee and the Nutrition Division of the Illinois Defense Council sponsored a conference on nutrition, which was held at Springfield June 19-20. Lydia J. Roberts, Ph. D., chairman of the Illinois Nutrition Committee and of the Department of Home Economics of the University of Chicago, presided at the opening session and gave an address entitled "How Is Illinois Equipped and Organized to Meet Its Nutrition Problems?" Dr. Roberts is a member of the Council on Foods and Nutrition of the American Medical Association.

Dr. Clifford Grulee, head of the pediatrics department of Rush Medical College, and Dr. M. H. Kronenberg of the Illinois Department of Public Health, among others, took part in a symposium on "What Is Our Nutrition Problem in Illinois?"

Helen Walsh, regional nutritionist of the Office of Civilian Defense, Health and Welfare Services, Washington, D. C., discussed "Highlights from the National Nutrition Program." Dr. Frank G. Boudreau, director of the Milbank Memorial Fund and chairman of the Food and Nutrition Board of the National Research Council discussed "Nutritional Problems in Wartime, with Special Consideration of the Nutritional Problems of Industrial Workers."

★ ★

FIRST AID TRAINING IN GARY STEEL MILLS

At the mills of the Carnegie-Illinois Steel Corporation in Gary, Ind., a round the clock program of first aid training has been set up which already has been completed by nearly seven hundred employees who have taken the twenty-hour standard Red Cross course in first aid. The schedule for the classes at these mills is arranged so that employees of all three shifts may participate. The classes are conducted by twenty instructors who have had Red Cross first aid certificates and are under the direction of Dr. D. E. Griffiths, chief medical officer of the emergency defense organization of this plant. One of the instructors was sent to Texas to receive special training in combating the effects of chemical and demolition bombs. The pupils who make the best records in the first aid courses are

selected for the stretcher teams, each being assigned to a definite station in the plant in case of emergency and each team composed of a captain and eight assistants. Others who have completed the course will be stationed in case of emergency at the four first aid and two dressing stations in the plant. Among those who have already completed their first aid course are one hundred ten girls, some of whom are expected to continue further training to qualify as nurses' assistants.

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MOBILE UNIT OF CHICAGO BLOOD DONOR SERVICE

The Chicago chapter of the American Red Cross placed in operation June 8, a mobile unit for the collection of blood from donors. Certain requirements must be filled by the local community requesting the mobile unit, and the facilities must be inspected and approved by a representative of the blood donor service of the American Red Cross before a definite date can be arranged. There must be a minimum of 100 persons over 18 and under 60 years of age who weigh 120 pounds or more and who are in good health. The local facilities must provide a clean, well ventilated space adequate for (1) a reception room to accomodate about 16 persons, (2) a room to accommodate ten cots with a sink with running water, (3) a smaller adjoining room or additional space which may be curtained off to be used as a recovery room, (4) a room with adjoining kitchen facilities which may be used as a canteen, (5) conveniently located toilets.

For the present, the mobile unit will not be sent outside of the area covered by the Chicago chapter of the American Red Cross, which includes Cook and DuPage counties and the southern half of Lake County, Ill.

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MANY JUNE GRADUATES ENTER MILITARY SERVICES

The annual national survey of colleges, technical schools, other than military academies and theological seminaries, and universities in the United States made by the Investors Syndicate indicates that 50 per cent of all the male graduates in June from one hundred and fifty-six leading institutions would join the Army, Navy or Marine Corps after commencement. Of another group of sixty-six schools, more than 25 per cent of the graduates were to enter the military services, while of a third group of one hundred schools less than 25 per cent of the graduates were to enter the military services.

Among the non-war positions offered to graduates, the profession of teaching received two out of every five "mentions," while secretarial work ranked second to teaching in non-war empolyment opportunities, being cited in one seventh of the "mentions."

The survey indicated that less than 3 per cent of the June graduates would enter such fields as medicine, chemistry, nursing, laboratory research, banking, selling, social work, home economics, accounting and clerical work.

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HOSPITAL CONTRIBUTES RUBBER PILLOWS TO SALVAGE DRIVE

The officers of Mount Sinai Hospital, New York, in ransacking the institution for scrap rubber, decided to turn in the sponge rubber pillows on which patients could lie and listen through radio earphones concealed inside. The one hundred and forty sponge pillows turned over to the government contain 400 pounds of high grade rubber. The hospital installed a central radio system in 1931 providing one hundred and forty rubber pillows with earphones. It has now been discovered that patients can listen comfortably to the radio simply by resting the earphones next to them in bed.

★ ★

EXPLOSION LABORATORY COMPLETED

An explosion laboratory, built of reinforced concrete topped by a hinged roof and specially designed to afford maximum safety to personnel, has been completed on the grounds of the National Institute of Health, Bethesda, Md. The laboratory will be used in the determination of the toxicity and potential health hazards of various old and new explosives.

★ ★

EMPTY VACOLITERS GIVEN TO ARMY AND NAVY IN HONOLULU

Since the raid on Pearl Harbor, Hospital Purveyors, Ltd., has issued more than 8,000 empty vacoliters free of charge to the army and navy and the several hospitals in and about Honolulu, and these hospitals have been permitted to retain the empty containers, since they use the contents for intravenous injections.

NEW ADDRESS FOR PROCUREMENT AND ASSIGNMENT SERVICE

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians may now be addressed at 1006 U Street N. W., Washington, D. C.

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ARMY PHYSICAL STANDARDS MODIFIED

The War Department has stated that the army physical standards have been modified, effective August 1, in order to call into limited military service under a regular quota system men now in class 1-B due to minor physical defects. Among the 1-B eligibles are men whose weight and chest circumference are under or over the standard set for class 1-A and who are not in class 4, who have a minimum of 20/400 in one or both eyes without glasses if correctable with glasses to 20/40 in either eye, whose hearing in one or both ears is not less than 5/20, who have lost an entire thumb on either hand or who have lost three entire fingers, provided the thumb remains.

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RUSSIAN WAR RELIEF

Russian War Relief, Inc., with headquarters at 535 Fifth Avenue, New York City, announced May 28, that in the eight months since it was organized it has expended $1,128,949.23 for relief supplies for use in the Soviet Union and is increasing its rate of shipments each month. The group is conducting a campaign for six million dollars this year.

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THE ARMY IS IN EXCELLENT HEALTH

The War Department announced June 29 that the Surgeon General reports that the health of the army is excellent. No general outbreak of acute respiratory disease occurred in the winter months, and compared to the previous winter, there was a reduction of 52 per cent for all diseases and 70 per cent for respiratory infections. Since the winter months, the admission rates to the army for all cases have showed a steady decline of nearly 25 per cent, due chiefly to a falling off in respiratory infections. The venereal disease rates are now lower than at any time since the beginning of mobilization, and the syphilis rate for the first five months for 1942 is the lowest in the history of the army. There has been a steady decline of as much as 30 per cent in cases of gonorrhea.

In recent weeks there have been numerous admissions to hospitals on account of jaundice, which has the characteristics, the War Department said, of catarrhal jaundice (epidemic hepatitis), but the total number of cases in the entire army has not been enough to appreciably increase the admission rate for all diseases. The War Department points out that this is definitely not yellow fever and it is not dangerous to the general public. The disease is being studied, however, by some of the outstanding medical scientists. Outside of the United States, health conditions in the army continue favorable. There have been no serious epidemics and only slight rises in admissions due to diseases peculiar to some of the new areas where the troops are established.

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MILD TINCTURE OF IODINE FOR WOUNDS

With the widespread interest in first aid instruction and the distribution of millions of first aid manuals throughout the country, the druggists have been swamped with calls for "Mild Tincture of Iodine, U. S. P.," which has been adopted for first aid treatment by the Army, the Navy and the American Red Cross. Since reports indicate that some druggists express ignorance of the existence of such a product, the formula for Mild Tincture of Iodine, U. S. P. follows:

	Metric Formula	Alternative Formula
Iodine	20 Gm.	146 grains
Sodium iodide	24 Gm.	175 grains
Diluted alcohol	to make 1,000 cc.	1 pint

Dissolve the iodine and the sodium iodide in sufficent diluted alcohol (equal parts of alcohol and water) to make 1,000 cc.

The label on this product should be somewhat as follows: Mild Tincture of Iodine. Contains 46 per cent alcohol. An antispetic for application to cuts and wounds. There should also be a poison label followed by:

ANTIDOTE:—Give starch, white of eggs or flour mixed with water. Follow with emetic of mustard. Give strong tea, coffee, stimulants of diluted alcohol, whiskey or 1 teaspoon of aromatic spirit of ammonia in water. Demulcent drinks of flaxseed, if needed.

According to E. Fullerton Cook, chairman of the Committee of Revision of the Pharmacopeia

of the United States of America, pharmacists should always sell the U. S. P. Mild Tincture of Iodine for first aid, not the strong (7 per cent) tincture of iodine; neither should they prepare the mild tincture by diluting the strong tincture, for then it will contain potassium iodide instead of sodium iodide, and the alcohol percentage will not be correct. Sodium salts are much better for application to a wound than are potassium salts. Dr. Cook's announcement says that the strong (7 per cent) tincture of iodine should never be applied to a wound, as it evaporates quickly, leaving crystals of free iodine in the wound, which injure the tissues and prevent healing.

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RECRUITING BOARDS—SULFANILAMIDE—STUDIES OF WORLD AREAS

War Secretary Stimson told his press conference that every American soldier going into a theater of operations will be provided with a package of 5Gm. of crystalline sulfanilamide to sprinkle on wounds in addition to twelve sulfanilamide tablets for internal use. He said the Army is increasing the number of medical department officers' recruiting boards to supply the need for additional doctors. Two additional boards have been authorized in New York, Pennsylvania and California, and one additional board in Massachusetts, Ohio and Illinois, while one board is functioning in each of the other states. A medical officer from the army air forces has been added to each of the twenty-nine recruiting boards to obtain doctors for the air service and a dental officer has been assigned to each board to assist in obtaining dentists. The recruiting boards may be located through local medical societies or the Surgeon General, Washington, D. C.

The Division of Medical Intelligence, Preventive Medicine Service, Office of the Surgeon General, has prepared a series of studies covering four general world areas on health, sanitation and climatic conditions. These instructions are being issued to military attachés and members of military missions, as well as to medical officers of overseas forces, to protect the health of U. S. soldiers sent to those regions. Subjects treated include water consumption safety precautions, protection against mosquitoes and other insects that carry disease, prevention of diseases indigenous to the various regions, bathing precautions, care of the skin and feet, selection of suitable clothing, prevention of sunstroke, energy conservation, and health maintenance under desert or tropical conditions, prevention of illness from food spoilage or contamination and many other hygienic precautions.

Secretary Stimson said that the Women's Army Auxiliary Corps now has two contract nurses and, as the corps increases, female medical officers may be inducted into the corps or will be contracted at the rate of five for ever thousand women.

THE CARE OF THE PATIENT—II

Your study of the patient should be skillful and intelligently complete, not needlessly comprehensive. If every known examination were made of every patient, much that goes undiscovered in diagnosis might be revealed, but who could survive the ordeal physically, physically or financially? Certainly, a complete diagnostic survey should be made of each condition until its nature is clear, but the routine performance of needless tests indicates a lack of skillful observation and thinking, dulls clinical acumen, penalizes patients, wastes time and material, and gives the public an incorrect view of the cost of sound medical care. Do not misinterpret—let the study be thorough, expand it as far as need be to solve a given riddle or to advance knowledge, but do not expect mere elaboration of procedure to replace your clinical sense, nor rely on it to impress your colleagues or your clientele.—*Charles R. Austrian, M. D., New England Journal of Medicine, October 31, 223:695-702, 1940.*

EFFECT OF SHELTER LIFE UPON HEALTH

The health of many Londoners during the period of severe and prolonged attack from the air was affected by their stay for many hours at a time in protective shelters. It had been anticipated that shelters would be necessary, and many, though not enough, had been provided, but it was not foreseen that the continuous nature of the nocturnal attack would necessitate the provision of sleeping accomodation. In these places, for some weeks before bunks could be provided, people slept on improvised beds and in deck-chairs. One surprising complication was the onset in a number of cases of thrombosis of the deep veins of the leg and consequent edema of the ankle and foot, due to the fact that a person reclining in such a chair is apt to have his legs press unduly upon the lower transverse bar. The thrombosis is brought about by the continuous pressure with relaxed muscles. —*V. Zachary Cope, M. D., British Medical Journal, April 5, 1941.*

Original Articles

CANCER CONTROL IN ILLINOIS

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SPRINGFIELD

From the standpoint of national economy, the control of cancer is a major public health problem. In the practice of medicine, it is largely a matter of early diagnosis and correct treatment. For the individual, it demands personal hygiene. By and large, cancer in Illinois follows the same pattern as elsewhere in the country and presents no important differences in behavior.

General Cancer Mortality — For a long period of years, cancer mortality has shown a numerical annual increase of about two per cent until it ranks second today as a principal cause of death, exceeded only by heart disease.

Whether this increase in the crude rate is apparent or actual, is a question which is frequently raised. Because of improvements in diagnostic methods there has been a gradual decrease in the percentage of incorrect diagnoses, and this would tend to increase the recorded mortality from the disease without an actual increase in the number of cases. On the other hand, there has been a marked and steady increase in the proportion of older persons in our population, particularly among those over 50; beyond which age the incidence of cancer is greatest and the vast majority of caner deaths occur.

On this basis alone, a marked increase in the cancer mortality may be expected for many years, even if the death rates in the various age groups remain at the present levels. This factor must be taken into account when measures for the control of this disease are considered, and when the success of such measures are evaluated.

An interesting, and more hopeful, aspect of the situation is the fact that the increasing death rate in recent years has not been uniform with respect to the various types of the disease.

According to U. S. Public Health Service reports, death from cancer of the skin, for example, have shown a significant decrease since 1920.

Analyzing the data from the industrial policy holders of the Metropolitan Life Insurance Company, Dublin stated in 1937 that " in the broad age period 35 to 55 the trend of the cancer death rate has been significantly downward for women. Such increases as are indicated in our data are almost wholly limited to men beyond age 55 and to women beyond age 65 (1911-1935)."

In 1934 Bigelow and Lombard stated that while there had been an actual average annual increase in the male cancer rate in Massachusetts during the years 1900-1915 and 1916-1932, there had been a significant drop in trend among females for the same periods.

"Where the deaths are subdivided by location of cancer," they state, "among the males significant downward trends are noted only in cancer of the skin. Among the females, digestive tract cancer and cancer of the skin have significant decreases. * * * Female genital cancer is about stationary, and cancer of the breast is slightly increasing. * * * It's our opinion that

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the improvement in the cancer death rate is caused by the concerted drive against cancer, by changes in the composition of the foreign population, and by the possibility of a saturation point in cancer being reached."

Federal Cancer Program —The federal government has officially recognized cancer as an important public health problem by the recent establishment of the National Cancer Institute at Washington.

The Institute has been staffed by scientists eminent in research. A National Advisory Cancer Council, consisting of six leading medical or scientific authorities in the cancer field, has been appointed to supervise its general activities.

The program of the Institute includes cancer research in its own and other laboratories throughout the country, aid in the development of cancer control programs in the States, cooperation with other agencies in lay education, the granting of fellowships to physicians for special training in cancer work, the loan of radium to hospitals for the treatment of indigent patients, and the financial assistance of universities and laboratories in their research problems. Publication of an excellent cancer Journal was begun in 1940.

Cancer Programs in State Health Departments. Massachusetts. Official cancer control work in State departments of health was pioneered by Massachusetts with the establishment of its Division of Adult Hygiene in 1926.

In response to public demand, the legislative enactment provided for the establishment of a state cancer hospital and local tumor clinics "with or without cooperation on the part of municipalities, local physicians or other agencies."

There are at present (1941) 21 state-aided cancer clinics in general hospitals, so located that a clinic is within 25 miles of any point in the state. These clinics are entirely diagnostic. Two cancer hospitals are now maintained for treatment: Pondville, 145 beds; Westfield, 50 beds.

Any Massachusetts resident may be admitted to the hospitals by certification of a practicing physician regardless of his financial status. The clinics are administered by committees appointed by the local medical organization. The standards of operation must meet health department requirements. Any physician may bring or send his patient for diagnosis. The patient is returned to the physician for his further action. The physicians give their time. Expensive diagnostic services (x-ray film, etc.) are paid for by the State if the patient can not afford it. For the clinic itself the State provides: (1) advice, information, and literature; (2) funds for a social worker, social worker's travel, x-ray diagnosis for those unable to pay, clerical assistance, postage and other miscellaneous expense, and for teaching clinics; (3) special clinics (by consultants) for the staffs of the clinics; and (4) reference of cancer cases to the cancer hospitals. A tumor diagnostic service at Boston gives any physician a report on specimens without cost.

New York. A Division of Cancer Control was created in the New York State Health Department in 1931, with the Cancer Institute at Buffalo (founded in 1910) as a part of this Division. In 1939 the Cancer Division was reorganized, with headquarters at Albany, following recommendations by a legislative Cancer Survey Commission.

The Cancer Institute at Buffalo has about 100 beds for cancer cases. Patients are admitted by reference of a practicing physician; and are treated without charge regardless of their ability to pay. There are 82 laboratories approved by the State for tissue diagnosis in 30 counties served by 44 pathologists. Of the 49 tumor clinics in the State, 23 are in New York City and 26 in the rest of the State. These clinics are at present maintained by the local hospitals; the only state aid is the provision of tumor consultants. For the terminal care of cancer cases, hospitals with a total bed capacity of 30,000 admit patients who can pay. For indigent terminal cases, New York City has about 530 beds and up-State New York has one institution with 110 beds (Hawthorne). The average stay in these institutions ranges from 56 days in general hospitals throughout the State, to 83 days in New York City hospitals for the indigent, and 133 days in the up-State hospital for the indigent (Hawthorne).

Regarding policy, Doctor Kress, Director of the Cancer Division, in a personal letter, said: "We are making every effort to keep the cancer care in the hands of the medical profession and

to make it unnecessary for the cancer patient to travel more than fifty miles to obtain this care."

Commenting upon the lack of adequate diagnostic and therapeutic facilities in up-State New York, a member of the Legislative Survey Commission stated: "These inadequacies could be met in one of two ways, by building new cancer institutes or by amplification of existing local facilities. Each method has its advocates and each its merits. It is possible that eventually both will have to be utilized. From a consideration of the imminent need of improving the awareness and knowledge of the general practitioner regarding diagnosis, and of making treatment readily available without the need for traveling long distances to obtain it, the Commission adopted the view that the present situation can best be met by utilization and extension of local facilities, in the form of adequately manned and equipped tumor clinics in various hospitals throughout the State."

In calling attention to the fact that 27 counties in up-State New York lacked laboratories approved for tissue diagnosis, the Commission stated, "It would appear that one of the important functions of a State program for the control of cancer should be that of providing adequate facilities for the pathological diagnosis of cancer wherever these facilities may be lacking."

Regarding terminal care of the indigent, a member of the Commission stated: "Perhaps the most difficult problem of all is that of providing terminal care for the great number of patients who are unable to pay for it. The question of subsidizing the hospitalization of these patients is still under consideration. In many instances these patients could be cared for at home, provided that facilities for nursing-care were readily obtainable. The Commission has accordingly recommended that the solution to the problem be sought in the direction of amplifying the facilities for home-nursing care in the various counties of the State, and has urged that communities make provision of such care a part of their general public health nursing program. Such a plan would enable the terminal cancer patients to remain under the care of his or her family physician and considerably reduce the need for hospitalization of these patients."

Connecticut, Georgia and South Carolina also conduct extensive cancer control programs as a direct function of the State health department. The activities of these departments are similar to those of Massachusetts and New York.

Illinois Division of Cancer Control — The Division of Cancer Control of the Illinois State Department of Health was created in 1939 by legislative action in response to a public demand. The law provided for an Advisory Board to the Division to be appointed by the Governor with the advice of the medical organizations. It also provided that the Chief of the Division be appointed by the Governor upon the recommendation of the Advisory Board. Appropriations included simply the salary of the Chief and a secretary. The Division functions as a component part of the State Department of Public Health, under the supervision of the State Director of Health.

Advisory Board — The present membership of the Advisory Board includes: D. J. Davis, M.D., dean of the University of Illinois College of Medicine, Chicago, Chairman; William Cooley, M.D., gynecologist, Peoria; Fauntleroy Flinn, M.D., radiologist, Decatur; Roswell T. Pettit, M.D., radiologist, Ottawa; James S. Templeton, M.D., president of the Illinois State Medical Society, Pinckneyville; John A. Wolfer, M.D., associate professor of surgery, Northwestern University Medical School, Chicago; and Edwin F. Hirsch, M.D., director of Henry Baird Favill Laboratory and pathologist to St. Luke's Hospital, Chicago, Secretary.

The Board holds monthly meetings; takes a keen interest in the work of the Division; and exercises freely its prerogatives. The Illinois State Medical Society is at present represented on this Board by its present President, the Chairman of its Cancer Committee, and a member of its Cancer Committee. This close association insures the conservation of the interests of the practicing physician and the soundness of this Division's activities from the medical standpoint, with resulting benefit to the public as its officially constituted agency for the control of cancer.

The program of the Division of Cancer Control falls naturally into four categories: lay

education, professional education, promotion of diagnostic and therapeutic facilities, and statistical research.

Lay Education — In the field of lay education, the activity of the Division is limited as far as possible to the preparation and editing of various forms of educational material. The excellent work of the Division of Public Health Instruction of the State Health Department along these lines is not duplicated.

Professional Education — The problem of professional education in cancer among physicians, dentists and nurses is considered to be of primary importance. A comprehensive book emphasizing the diagnostic points of cancer care is in course of preparation, for distribution to physicians by the State Health Department when it is completed. Similar books for dentists and nurses are contemplated. As the work of the Division advances, it is hoped that substantial assistance may be made available to medical and other professional groups in the organization of cancer symposia for the general practitioner, cancer seminars for specialists in the field, and similar educational opportunities, all to be conducted under proper professional auspices.

In this connection, it may be profitable to pause for a moment and listen again to the words of Malcolm L. Harris: "Medicine is not a dead subject but a living one that is progressing at a more rapid pace today than at any time in the history of its existence. *Any physician to keep abreast of the progress that is being made, must be an eternal student.* No eight-hour work-days are his; the candle frequently burns at both ends." True twelve years ago when he said it, even more true today.

Promotion Facilities — The promotion of more adequate diagnostic and therapeutic facilities for the care of cancer cases is a major function of the Division of Cancer Control.

It is the consensus of authoritative opinion in the cancer field that tumor services in general hospitals constitute the most effective means of reducing cancer morbidity and mortality. Many general hospitals in the State find it hardly possible to maintain these facilities with the limited resources at hand. This Division has accordingly planned to render substantial assistance in the establishment of such a service to a small number of hospitals strategically located throughout the State, where the need is unquestionable, where the requirements can be met, where the greatest number may be served, and where such aid may be desired.

In conformity with sound policy, the approach to any locality for the proposed establishment of a tumor diagnostic service in a general hospital shall be without exception, through the local medical society and with the formal approval of that body.

Since such a service is essentially a hospital function, the local administrative hospital board shall have complete and independent control of the organization and operation of this facility as an integral part of the hospital program. The Division of Cancer Control will act simply in an advisory capacity; but will reserve the right to withhold support whenever satisfactory standards are not maintained.

This contemplated project has been carefully considered and approved in principle by the Advisory Board to the Division. Its initiation is at present contingent upon an apropriation by the Legislature now in session.

Statistical Research. — Statistical data do not as a rule render direct service to a patient in any public health program. Yet any well conducted enterprise must keep books in order to be able to run the business efficiently and also to calculate the return on the investment. In cancer control we must be satisfied with small gains over a period of years; and this makes it more imperative that we study closely the factors which may be responsible for less desirable end results.

DIAGNOSIS AND TREATMENT OF CANCER

It is now generally recognized that cancer is not a single disease but a great group of diseases differing widely in their make-up and behavior. Every tissue and organ of the body is subject to malignant growth. No age is free from cancer. It is an important disease of childhood as well as of middle and later life. Cancer of the breast has occurred as early as 17 years of age. A death from cancer of the uterus in a girl under 20 was reported from Illinois in 1939.

The onset of cancer is often utterly devoid of early signs or symptoms. One of the most amazing situations is the apparent good health of many persons suffering from early or even well established cancer, with little or no complaint. When early signs of cancer *are* present they so often resemble conditions which may be referable to other diseases that a differential clinical diagnosis is difficult if not impossible.

It has been estimated that most physicians in general practice, the country over, see about three cases of cancer in a year. On this basis, it is hardly reasonable to expect that he will recognize each case encountered. It does seem fair to expect, however, that he will give his patient the benefit of simple but careful examinations which may be quite revealing to even the ordinary observer.

One of the most effective means of familiarizing the general practitioner with cancer in its protean forms is the concentration of patients in the tumor diagnostic service of a general hospital which is conveniently accessible to him, where he may see in one morning more cases of malignant disease than he may encounter in his private practice during several years.

Every case of cancer which comes to a physician's office is an emergency. Upon his judgment the fate of the patient often rests. In no other disease does early diagnosis and correct treatment have such an important bearing upon the survival of the patient as in cancer. As Will Mayo has so aptly said, "A cancer that comes to you is less malignant than one that goes away from you."

The diagnosis and treatment of cancer is no longer a "one man job." To give the cancer patient of today the best service, the general practitioner must refer him to more competent hands; the cancer surgeon must know radiation therapy; the radiologist must know cancer surgery; and both must be acquainted with the science of the pathologist.

Cancer as a Personal Problem. — With rare exceptions, cancer is an essentially personal matter. It apparently has little relationship to the influences of environment or to human contacts. Cancer comes from within; obscure in its origin, insidious in its onset and stealthy in its destruction.

For the individual, the avoidance of cancer is largely a matter of maintenance of personal hygiene. Years ago (1934) MacCarthy of Rochester said, "Cancer is, in my opinion, a simple problem, although the various specific causes may never be known and no specific cure ever found. It is a problem of health in general, external and internal cleanliness, and heredity."

We may accept his first premise perhaps, and question the latter. Plain soap and water has long been advocated by Ewing as a most effective prophylactic against mouth cancer. Bloodgood used to say that he never found cancer of the face in a beautiful woman because she paid so much attention to her complexion. As to heredity, the geneticists are probably correct in stating that the individual need not be worried about that as far as cancer is concerned. It is difficult to make mice of men. And the only *sure* thing we know about any man's heredity is that his ancestors were not sterile.

An important cause of disastrous results in the treatment of cancer is the failure of the individual to recognize the significance of early signs. In some cases the failure of the physician to make a satisfactory examination is responsible for an avoidable fatality. In many cases, with the nature of the disease the same, and the method of treatment the same, *the stage of the disease* makes all the difference between success and failure.

CONCLUSIONS

In conclusion may we repeat that cancer is recognized as a major public health problem and therefore has a legitimate place in every well balanced public health program. By an intelligent application of the knowledge now possessed cancer can to an appreciable extent be controlled.

The importance of the early diagnosis and correct treatment of cancer, in the practice of medicine, can not be over-emphasized. The cure of cancer is no longer an "one man job."

As Bowman Crowell has well said, "Important as lay education may be, there is little use in arousing public interest in cancer if organized facilities for diagnosis and therapy are not available and if the profession in general is not alive to the advantages thus offered."

In his address as retiring president of the American Association for the Advancement of Science, in 1937, Conklin of Princeton University stated, "Scientific progress in medicine . . . is far in advance of its social utilization, but not in advance of its urgent need."

DISCUSSION

Dr. Erich Uhlmann, Chicago: The excellent presentation of Dr. Brokaw on the organization of the fight against cancer and the efforts of the Illinois Division of Cancer Control has covered the problem in question so thoroughly that there is little left for discussion. Therefore, I shall limit myself to emphasize one point already mentioned by Dr. Brokaw: the professional education; and furthermore to say a few words about our own organization at the Michael Reese Hospital and the functions of a tumor clinic in a general hospital.

The laity has, at least in the larger communities, become well aware of the danger of cancer. But from our experience in our daily work, it is our impression that the accomplishments in cancer diagnosis and therapy have not reached the general practitioner to such an extent as to markedly improve the care for the cancer patient. This is in our opinion only to a small degree due to failure on the part of the general practitioner, but rather a failure in our medical training system. In restricting myself to the situation in Illinois, there is to my knowledge not one medical school in the State which has provided for special courses or classes in cancer diagnosis or therapy. One may object that the problem of cancer is such a difficult one that it must be left to post-graduate schools for teaching and training the medical profession. But apart from the fact that even post-graduate training is offered to only a limited amount and this often by private institutions, there is certainly a definite need for such courses in our medical schools in order to familiarize the student with the problem and to arouse and stimulate his interest. I believe that it is a task for the State University to take the lead in creating such courses in the management of malignant diseases for the and to lay the foundation stone for better training medical profession.

The second point that I wish to discuss briefly is the functioning of the Tumor Clinic in a general hospital as executed in the Michael Reese Hospital. This Tumor Clinic is organized according to the rules laid down by the American College of Surgeons and is approved as such by this organization. It is built upon the Cooperation of the representatives of the different departments of the hospital (surgery, gynecology, internal medicine, pathology, etc.,) who have a special interest in malignant diseases and serve for a period of three years in this group. We hold clinics twice a week where the diagnosis of the individual case is thoroughly discussed and the course of therapy decided upon. These clinics are held under the leadership of the Director of the Tumor Clinic, who in our case is at the same time the Attending Radiotherapist of the hospital. It is a hospital rule that all patients of the out-patient department and of the hospital wards with malignancy or suspicious malignancy, *must* be seen in consultation by the Director of the Tumor Clinic before any specific therapy is started. This rule guarantees that all malignancies in the hospital are actually under the control of the Tumor Clinic which remains in control through its own filing system and its own social service department for the lifetime of the patient.

In the more than three years since I have had the privilege of directing this Tumor Clinic we have encountered only very few difficulties in handling cancer patients. We have found it advisable to hold special clinical conferences once a month for the members of the staff of the hospital where interesting tumor cases are demonstrated, the diagnosis discussed, and the therapy analyzed, the literature reviewed, microscopic slides and x-ray films studied, and all questions involved frankly discussed. These conferences have proven of great value in integrating the work of the Tumor Clinic with the various departments of the hospital, to create interest among other physicians on the staff and for the mutual benefit of the members of the Tumor Clinic group. The time is too short to go into further details, but we are convinced that our work is contributing its share to the common task of improving the facilities for the patients suffering from cancer.

Dr. R. V. Brokaw, Chicago. Conclusion: I appreciate very much Dr. Uhlmann's kindly words of commendation. I want to congratulate him on the results accomplished at Michael Reese Hospital in the operation of their cancer clinic.

I appreciate very much the opportunity of presenting to this body facts regarding a disease which is of first rank so far as its possibilities in Illinois are concerned.

EFFECTIVE TREATMENT FOR AN EYE DISEASE

The direct application of a 5 per cent ointment of sulfathiazole or sulfathiazole sodium was effective in causing rapid healing in 11 of 15 cases of inclusion conjunctivitis (inflammation of the membrane that lines the eyelids and covers the eyeball in front, due to a particular virus) in infants, children and adults, Phillips Thygeson, M.D., and William Stone Jr., M. D., New York, report in *The Journal of the American Medical Association* for May 30. In 10 of the 11 cases the virus could no longer be found after the third day of treatment. Two of the remaining 4 cases, 1 in a child and 1 in an adult, required supplementary treatment by mouth; the remaining 2 cases, both in infants, failed to heal until the mothers learned to employ the medication properly. There were no recurrences. Untreated cases of the disease take from four to six months to heal.

ESOPHAGEAL DIVERTICULUM

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The first clear description of an esophageal diverticulum was published by von Ludlow[1] in 1769. Previous to that time, esophageal diverticula had been found only at autopsy. Ludlow's patient lived for five years, death being caused by the diverticulum.

In the years following 1769, according to Starck,[2] a few articles on esophageal diverticula were published, notably by Isenflamm (1778), Bucking (1781), Giannella (1782), Marx (1783) and Roennow (1783). These authors recognized the disease during life and suggested such therapeutic procedures as the giving of nutrient enemas and esophageal tube feeding; later bougies were used.

In 1877 Zenker and Ziemssen[3] published a monograph on diseases of the esophagus and established a classification of diverticula of the esophagus into those of traction type and those of pulsion type — a classification that is still in use today. The pulsion diverticulum, which arises from the lower portion of the pharynx, is also called a pharyngoesophageal diverticulum and is often spoken of as the Zenker diverticulum. It is recognized more easily during life because it almost always produces difficulty in swallowing.

In 1900 Hugo Starck[2] published his monograph on diverticula of the esophagus, in which he reviewed all of the cases reported by Zenker and Ziemssen and all others reported up to the time of his study. Since 1900 a rather extensive literature on esophageal diverticula has arisen, but, despite this fact, it is of interest that there are many patients with esophageal diverticula who suffer from dysphagia for many years before the cause is discovered. It seems strange that a structure which performs so frequently such a simple mechanical function as swallowing and which is so readily examined either fluoroscopically or by means of the esophagoscope, should hide its diseases so easily. The early symptoms frequently appear to be insignificant and probably are interpreted as due to esophageal or pharyngeal neuroses.

The most common site of a diverticulum of the esophagus is the lower portion of the pharynx. These diverticula are designated as pharyngoesophageal diverticula, as the pulsion diverticula of Zenker or as high esophageal pulsion diverticula. The second site is in the region of the left main bronchus, where the so-called traction type of diverticulum develops; these are thought to be due to inflammatory changes in close proximity to the esophagus which pull the esophageal wall outward. The third site is at the cardia.

The diverticula of the thoracic portion of the esophagus are rarely of sufficient size to cause symptoms. Barrett[4] reviewed the literature in 1933 and found reports of 115 cases. He concluded that unless the diverticulum was rather large, few of the patients noted any symptoms.

Vinson[5] collected reports of 42 cases observed at the Mayo Clinic and was impressed by the difficulty of evaluating symptoms and of associating them with the lesion in the esophagus. In 12 cases the symptoms were apparently not related to the thoracic diverticulum. In the remaining 18, it appeared that the symptoms could be associated with the thoracic diverticulum. These symptoms were dysphagia, epigastric pain, vomiting, regurgitation, substernal distress, gas on the stomach, anorexia, belching, bloating, loss of weight, cough, chills, fever, heart burn, nausea, regurgitation of blood and hiccup. However, in the majority of cases the symptoms were mild, and no treatment was instituted. Eight of the 18 patients had cardiospasm, and 6 were relieved after dilation with a hydrostatic bag. Four of the remaining 10 patients were relieved by the passage of sounds into the stomach.

The pharyngoesophageal or pulsion diverticula of the upper portion of the esophagus cause definite, recognizable symptoms. Whether or not they should be classified as true diverticula is questionable. Such a diverticulum is actually a herniation at the pharyngoesophageal junction and consists of a pouch of the mucosal layer of the esophagus which herniates through the triangle formed by the circular and oblique fibers of the inferior constrictor muscle of the pharynx.

As this area does not have an adequate muscular support, compression at this point may produce a form of herniation in the act of swallowing.

The symptoms of the patient with a pharyngeosophageal diverticulum can be divided roughly into two groups. In the early stage the patient may note mild dysphagia in swallowing various types of food. This may be noted particularly with dry foods, which appear to stick in the patient's throat and which he had to wash down with water. He may observe quite early a peculiar gurgling noise in his throat on swallowing. It is thought that this sound is due to the regurgitation of a bubble of air from the diverticular sac in the act of swallowing. Salivation is an early symptom and may be particularly annoying at night. A few of these patients note regurgitation of food or saliva only when stooping over, and some are annoyed by an irritating cough, noted more frequently when lying down.

The early symptoms become gradually aggravated, and as the sac enlarges, pressure is brought to bear on the lateral esophageal wall, obstructive symptoms then becoming more evident. The pressure on the esophageal wall may not be due entirely to enlargement of the capacity of the sac but also to an acute and chronic inflammatory process producing a thickening of the wall of the sac. As this inflammatory thickening progresses and as the sac enlarges, the diverticulum begins to point downward, so that the large sac appears to enter the upper part of the thorax. As the sac is pulled downward, the wall of the esophagus is pulled upon, and the lumen of the esophagus is further obstructed. In addition, the opening into the esophagus is reduced in size, and a few of these patients may experience pain at the site of the diverticulum. Frequently they will relieve this pain by ejecting food from the sac by forceful regurgitation, by stooping over (draining the sac by posture) or by using external pressure. As the difficulty in swallowing becomes more and more marked, leading occasionally to almost complete obstruction, loss of weight, secondary anemia and avitaminosis are notable.

In the diagnosis of an esophageal diverticulum the clinical history is by all odds more important than the clinical signs. Palpation, auscultation and percussion frequently are of little value. The general weight loss and anemia are apparent when marked obstruction to swallowing is present. The most reliable clinical evidence is disclosed by fluoroscopic examination, which readily outlines the diverticulum. If there is an extremely small diverticulum near the lower portion of the pharynx, it may be visualized only with difficulty, especially if the opening is so large that emptying occurs almost immediately after the barium mixture is swallowed. Esophagoscopic examination, which is not without some hazard, rarely has to be performed and then only to rule out a possible neoplasm in the sac.

The treatment of a high esophageal pulsion diverticulum, that is, the diverticulum whose pouch arises above the sphincter formed by the cricopharyngeus muscle, is surgical. The treatment of a diverticulum in the lower portion of the esophagus is symptomatic.[6] The evolution of the operative treatment of esophageal diverticula is of considerable interest. According to McClure[7] the first operation for this condition was performed by Nicoladoni,[8] in 1877; but the first successful operation was that of Wheeler,[9] in 1886. Cases were reported by von Bergman and Kocher in 1892. In 1904 Halstead[10] reported a case in which treatment consisted in invaginating the small sac. Invagination by circular and longitudinal pursestring sutures was reported by Bevan[11] in 1917. In 1907 Goldman[12] reported 2 cases in which the two stage operation was employed. In the first stage the neck of the sac was ligated to close off the diverticulum to food, but not so tightly as to strangulate it. In 1910 Charles Mayo[13] warned against the danger of fatal aspiration from emptying the contents of the sac into the pharynx. In this same year Stettin[14] reported an operative mortality of 18.7 per cent in 48 cases, the principal danger being infection. According to Gottstein,[15] in a series of 66 cases without operative treatment, 36 died of the malady. By 1915 the operative mortality in 70 cases had fallen to 11 per cent.[15]

It was early recognized that the chief danger in these operations lay in infection of the mediastinum resulting from opening the sac. As late as 1916 one sees the statement: "As a preliminary operation to extirpation of the diverticulum, gastrotomy is advisable."[15] Greater

safety was secured by mobilizing the sac in the first stage of the operation, and, after ten to fourteen days, during which the mediastinum becomes well walled off, removing the sac. In 1916 Murphy[16] and in 1919 Halstead[17] recommended the two stage operation. In 1918 Judd[18] thought that infolding was satisfactory for a small sac but advised the two stage operation for larger sacs. Judd and Moersch[19] recognized the parts played by Murphy and Mayo in the development of the two stage procedure. The latter[20] recommended the two stage operation when the sac extended to the thorax.

At the present time the one stage operation has been revived and has many notable advocates. The lowered mortality is attributed to more accurate closure of the esophagus. In 1930 Jackson and Babcock[21] reported 7 cases in which the operation was successfully done in one stage with esophagoscopic assistance. In 1931 Babcock and Jackson[22] continued to advise the one stage procedure with location of the sac by means of the esophagoscope. The sac was cut off and the esophagus closed with two layers of fine silk and the overlying tissues with chromic catgut and silver wire. Eliason, Tucker and Thigpen[23] have stated that the "procedure of choice is the one stage operation with the aid of the esophagoscope, anesthesia being avertin and local." These authors reported 10 cases with 1 death. Torek[24] prefers the one stage operation and believes that the esophagoscope should be in the esophagus while the suturing is in progress, the opening being surrounded with protective gauze. Jones[25] has performed 35 one stage operations and strongly prefers this method. In a letter to McClure,[7] Lord Moynihan urged the employment of the one stage operation, which he had used successfully in 15 cases. McClure[7] reports an interesting case in which the sac was dissected free from the outside and then inverted with a catheter inside and removed with a snare.

The two stage operation, however, has received the heartiest endorsement. Eggers[26] says: "A study of the literature shows that, owing to the diminished likelihood of mediastinitis, the two stage method has a lower mortality." The outstanding exponent of the two stage operation at present is Frank Lahey. In 1937[27] this surgeon studied the end results in 53 cases of two stage operations and found good results in 49. In 1939 he[28] reported 104 operations by the two stage method with only 1 death. The two stage method is also endorsed by Heyd,[29] McClure[7], Judd,[30] Macmillan[31] and McEvers,[32] and, as has already been stated, by J. B. Murphy, Halstead, C. H. Mayo and Eggers.

The operation may be carried out under general anesthesia, but local anesthesia is considered much safer. The deep (paravertebral) cervical plexus block, which has been well described by Woodbridge,[33] will afford anesthesia of the esophagus and other deep structures. The superficial cervical nerve block is considerably safer.[34] We believe that this should be preceded by the giving of 60 to 70 mg. per kilogram of body weight of avertin by rectum and supplemented for a short time, if necessary, by inhalation of ethylene. In most cases fluids and food will be administered for two to four days by means of a Levine catheter passed through the nose. Lahey[35] stresses the importance of passing bougies every two or three months for the first postoperative year.

CASE REPORTS

Case 1. — S.K., a man aged 33, was admitted to the Evanston Hospital on Feb. 20, 1940. He complained of difficulty in swallowing foods, especially solid foods, and of regurgitation of eight months' duration. He stated that beginning eight months before admission to the hospital such foods as apples, nuts, crackers and bread seemed to stick in his throat every time he tried to eat them and that he was able to cough the food up. This dysphagia became more severe until, two months after the onset, fluids and soft foods also were swallowed with difficulty and were regurgitated. No pain was felt on eating, but a sense of constriction in the neck was noticed. During the next four or five months his diet was limited almost entirely to liquids and soft foods, six or seven feedings being taken daily, but dysphagia and regurgitation persisted. Regurgitation usually took place about thirty minutes after eating, but at times the patient was aware of food being passed into the mouth that had been eaten as long as twelve hours previously.

The patient was a well nourished man who did not appear acutely ill. Physical examination revealed no abnormality. The blood pressure was 122 systolic and 66 diastolic; the pulse rate, 80; respirations, 18; temperature, 98.6 F.; hemoglobin, 90 per cent; erythrocytes, 4,260,000; leukocytes, 9,600; Kahn reaction, negative; urinalysis, negative. Roentgenologic examination with barium given by mouth demonstrated a

medium-sized diverticulum in the upper third of the esophagus. The gastrointestinal x-ray findings were negative. A two stage operation for removal of the diverticulum was done. On Feb. 24, 1940, the first stage incision was made along the anterior border of the sternocleidomastoid muscle. After the superficial fascia had been separated, the sternocleidomastoid muscle was retracted laterally and the prethyroid muscles medially. The omohyoid muscle was then cut. The middle thyroid vein was cut and the gland retracted medially. In this manner the sac was exposed and grasped with Babcock forceps and retracted into the operative field. It was then carefully dissected free down to the base of the diverticulum. The blind end of the sac was then attached to the prethyroid muscle by means of two interrupted silk sutures. A cigaret drain was then placed in the upper portion of the mediastinum and the skin closed with black silk sutures.

On March 5, ten days after the first stage, the second operation was done. The incision was made in the scar, and the sac was readily found with the aid of the black silk sutures that had been left in. The diverticulum was freed down to the neck, then split in half; the mucosa was dissected down to the base and cut off. A tube was passed through the nostril into the stomach, and a drain was placed down to the neck of the sac. The skin was closed with silk. The anesthetic used for both stages was nitrous oxide-ether. Wangensteen suction was employed for one day following the first operation. Fluids and St. Mary's formula were begun on the first postoperative day after each stage, being given through a Levine tube. The tube was removed on the fifth day after the second operation, and the giving of small amounts of fluid by mouth was started.

The pathologic diagnosis was esophageal diverticulum. The stratified squamous epithelium was slightly thickened, but the submucosa was normal.

Case 2. — S.W., a man aged 67, was admitted to the Evanston Hospital on Sept. 6, 1940. He complained of difficulty in swallowing, with regurgitation of the swallowed food, since 1930. At first there was difficulty in swallowing solid foods, and this condition gradually became worse. The patient consulted a physician in 1931, and a diagnosis of diverticulum of the esophagus was made. Surgical removal of the diverticulum was advised, but the patient did not consent to an operation. The dysphagia and regurgitation gradually increased until, in 1934, he was unable to eat solid foods. Since that time his diet had consisted of liquids and soft foods — raw eggs, milk and cream, orange juice and soups. On this diet dysphagia and regurgitation were less severe but persisted and gradually became worse, until at the time of operation the patient estimated that between 25 and 50 per cent of the food swallowed was regurgitated. This usually took place about an hour after ingestion. During the past ten years the patient's weight had decreased from 130 to 93 pounds.

The patient was a poorly nourished, poorly developed, asthenic man, weighing 93 pounds. The systolic blood pressure was 112 and the diastolic 70; pulse rate, 80; temperature, 98.6; hemoglobin, 81 per cent; erythrocytes, 4,760,000; leukocytes, 10,000; Kahn reaction, negative; urea nitrogen, 16.86; blood cholesterol, 244; urinalysis, negative. Roentgenographic examination after the giving of barium by mouth showed a diverticulum with a broad base in the middle third of the esophagus.

A two stage operation for removal of the diverticulum was decided upon. Dextrose and Ringer's solution was given intravenously for twelve days preoperatively. A Levine tube was passed into the stomach on the fifth preoperative day, and fluids and St. Mary's formula were introduced through it. On September 19 an incision was made anterior and parallel to the left sternocleidomastoid muscle. The superficial fascia of the neck was divided by blunt dissection; the carotid sheath and thyroid gland were identified, after division of the omohyoid muscle. The carotid sheath was retracted laterally and the thyroid gland medially; the adhesions about the sac were freed by combined blunt and sharp dissection. After the sac was freed it was tacked to the strap muscles of the left side of the neck with four black silk sutures. A rubber drain was placed down to the base of the sac, and the skin was closed with interrupted silk sutures.

On October 3, fourteen days after the first stage, an incision was made through the scar, the diverticulum was located and the surrounding adhesions were carefully dissected free. The base of the sac was found to be unusually large — about 3 cm. in diameter. The submucosa was carefully stripped from the mucosa, after the sac was opened, and the opening in the mucosa was closed by suturing after excision down to the level of the esophagus. A rubber Levine tube was passed into the stomach, a plain gauze drain was inserted down to the closed stump of the diverticulum and another into the lower end of the wound in the direction of the mediastinum. Several stitches with O chromic catgut sutures were taken in the superficial fascia, and the skin was closed with interrupted silk sutures.

For both stages avertin, 70 mg. per kilogram of body weight, was used as a basal anesthetic, and 1 per cent novocaine was used locally by infiltration and for superficial cervical nerve block. During the second operation a small amount of ethylene was also employed.

After the first stage, fluids were begun by mouth on the second day. Following the second stage a Levine tube was passed and liquids were given on the second day through it. The tube was removed on the fourth day and feedings by mouth were begun. The patient was discharged on October 14, eleven days after the second operation. At that time he was receiving a soft diet.

The pathologic report on the specimen was esophageal diverticulum with nonspecific granulomas in the wall.

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VASOMOTOR RHINITIS: A PHYSIOLOGIC AND PATHOGENETIC BASIS FOR THERAPY*

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"Empiricism" is preferred to designate the character of this clinical report of a highly effective, uncomplicated and inexpensive form of treatment† of so-called "Vasomotor Rhinitis." Certain histologic and neurophysiologic facts, because they represent "Science," will tend to mask the issue by rationalizing the technic to be described in the following pages. Too many patients are not relieved after submitting to innumerable tests and treatments which are in vogue clinically on the predication of their so-called scientific origins — particularly notorious in Allergy.

Such conditions hardly permit us to indulge in fancy procedures. For practical purposes, the choice of therapy is still "symptomatic" in form — in the writer's experience, "Local" and preferably qualified as being "Empirical."

An exhaustive survey of medical literature has been avoided, especially refraining from a recitation of an almost universal acquaintance with the many facts and theories of "Vasomotor Rhinitis."

Indeed, such a survey would undoubtedly reveal similar ideas reported long before the writer developed his method.[1] The therapeutic principles which support the feasibility of "Local therapy" — are old ones. Examples are in the early use of topical applications of phenol to the nasal mucosa and later, of galvanic currents through the medium of solutions of zinc chloride. The course of investigation continues to be one of replacing such exogenous conceptions of Vasomotor Rhinitis by more basic, or endogenous, determinations — to establish and to treat endocrine, psychosomatic and allergic dysfunctions instead of the nasal, or "shock," organ directly

Lastly, it is hoped that scientific displays and testimonial records will contribute to this clinical paper by their omission.

*Preliminary reports, beginning in 1933, at Conferences of the Department of Otolaryngology, University of Illinois College of Medicine and Research and Educational Hospitals, Chicago.

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SYMPTOMATOLOGY GOVERNING SELECTION OF PATIENTS

Conditions that are possibly etiologic factors receive attention only for the purpose of completing the history of each patient and for future reference.

Excessive sneezing, nasal blockage and hypersecretion — singly or in combination — are a basis for selection when perennial in character whether associated with "Hay Fever" or not.

Suppuration is absent.

Turgescence, especially of one or both inferior turbinates, is found usually in association with a *pale* mucous membrane; occasionally, with a diffusely *reddened* mucous membrane.

Hyperplastic changes of the nasal mucosa, when present, usually exist in the form of redundant tissue along the inferior turbinates; more extensive processes are seen as papilliform excrescences on one or more sites of the turbinates and/or septum.

TECHNIC

General remarks; sedatives; anesthesia. — There is a uniform reaction to treatment in that it is consistently followed by an increase in the symptoms — in varying degrees. This discomfort seldom lasts longer than twenty-four hours. Consequently, it is imperative to treat one side of the nose at a time and, for the first time, to do so moderately. If possible, that side is treated first which can be identified *by the patient* as causing the most discomfort. This particular procedure is explained to each patient before any treatment is begun to insure his confidence. At the end of the second or third week, both sides of the nose are treated during a single visit without causing a severe reaction. The intervals between each treatment range from four to seven days; they (treatments) commonly extend over a period of three to four weeks.

Phenobarbital was administered routinely by the writer at least 15 minutes before applying any local anesthetic. For the past year, *Seconal Sodium (Lilly), 3/4 to 1 1/2 grains, has proved to be more effective, acting within 15 minutes and lasting for about 2 hours. An Enseal of Ephredine Sulphate, 3/8 grain, combined with Seconal Sodium, 3/4 grain, (Lilly), is administered at the same time to control a possible reaction later in the day. Too, this barbiturate has little if any after-effect.*

Adrenalin chloride solution (1-1000) is applied (or sprayed) in sparing amounts only to that side which is to be treated. This is followed with a small amount of a 1% solution of cocaine hydrochloride in the form of a nasal spray. The mucosa of almost (See Interpretation, No. A) the entire nasal chamber is most thoroughly anesthetized with a 5 to 10% solution of Cocaine Hydrochloride (first, with a sparing quantity from an atomizer, followed by adequate applications with the same drug on moistened cotton — on *metal* applicators, as described below), depending upon the patient's threshold to pain. Not one case of cocaine intoxication has occurred to date. *A sterile syringe and an ampoule of Sodium Amytal (Lilly) 3 3/4 grs. to 7 1/2 grs. is always available and ready for immediate use, nevertheless.*

The objectives are two-fold in character: (1) To traumatize the surface of the mucous membrane in the region of the anterior portion of the middle turbinate, roof of the nose and adjacent areas of the septum by rubbing with a *cotton-tipped* metal applicator; (2) To apply a motion of massage — avoiding the technic of "traumatic-rubbing" described under (1) above — to the deepest structures of the inferior turbinates with the same type of applicator. The applicator is applied *firmly,* maintaining considerable pressure and, of greatest importance, fixing the end of the applicator to one spot at a time: anterior, middle and posterior points of the inferior and medial parts of the inferior turbinate. The motion of *deep* massage at the point of application is circular, horizontal or both in direction, in a more or less rhythmical steady movement for a period of about a minute to each of the six *arbitrarily* selected parts of the mucosa.

The metal applicator must be rigid to obtain the degree of pressure required.

COURSE

A. Immediate Effects

1. *First twenty-four hours.* — Depending as much upon the patient as upon the vigor of the

treatment he has received, their is, later, an increase in nasal blockage and paroxysms of sneezing; sometimes, moderate pain and headache. Such paroxysms should be mild in character! To avoid undue *thoroughness* which invariably produces such reactions at the beginning, the Rhinologist must — and can — determine the tolerance of each patient by the *reaction of his patient to the first treatment.*

A capsule of ephedrine sulphate combined with seconal sodium (or any similar barbiturate) is *dispensed,* to be taken later in the day if necessary.

It is essential to emphasize, and, therefore, unavoidably necessary to repeat, that the patient should be told to expect the reactions described above — so dismissing, quietly and effectively, any alarms from his mind when they occur. In no instance have any of these reactions lasted for more than twenty-four hours (See case described under Complications which may be considered as a minor exception). Otherwise, if the patient returns for a second treatment, he is too trusting or/and the Rhinologist, unusually endowed.

2. *After "first twenty-four hours."* — The greatest number of patients experience marked or complete relief from sneezing, from nasal blockage and, to a lesser extent, from hypersecretion. This effect is obtained in less than forty-eight hours and usually lasts for about three, four or five days, although to a lesser degree at this early time than when the series are concluded.

B. Schedule of Therapy; Duration of Relief

1. *Subjective Symptoms.* — About 4 weeks, consisting of 4 to 6 treatments suffice; usually, three for each nasal cavity.

The intervals of complete relief have varied from a few months to many years.

In cases of extensive hyperplastic changes of the nasal mucosa, particularly of the posterior portions of the inferior turbinates, the usual surgical and electrosurgical procedures are required before discharging the patient. At this time, grossly discernible areas of useless (hyperplastic) tissue are relatively minimal. The usual treatment, by galvanocautery or snare, is reduced in extent accordingly and is advisable to enhance the degree of improvement already experienced by the patient.

2. *Objective Symptoms.* —It is peculiar, and characteristic, that patients who respond well to treatment react almost monotonously in their similarity to each other, both in the sequence and chronology of events during the brief period of time required to obtain the desired effect.

Redundant and pale areas of mucous membrane (of the inferior turbinate or septum) become less redundant and red after the first *thorough* massage. The tissue is firm to touch (palpated with a cotton tipped metal applicator) and pink. Clinically, it may be considered that there has been a restoration or resumption of the physiologic activities of previously pathologic tissues. It needs but few experiences like this to demonstrate this conception to be reasonable.

Recurrences duplicate the "personality" of the past symptomatology and response to treatment "for each patient." These recurrences are commonly milder than before.

COMPLICATIONS (ABSENCE OF)

There have been no complications.

The procedure is intended to be traumatic and to produce superficial abrasions of the mucous membrane; later, ulcerations. These disappear quickly in the same uneventful manner as those which are caused by chemical caustics or galvanocauterization.

One case is of interest: A thick, diffuse, pseudomembranous coagulum appeared on the third day over the entire surface of the inferior turbinate. The coagulum loosened and was removed readily 5 days later. The underlying mucous membrane was grossly normal, recalling experiences during 1928 when zinc ionization almost became popular in the treatment of so-called "intumescent rhinitis."

The inferior half of the septum is never traumatized (see Interpretation: A), especially because of the possibility of producing an indolent, ulcerative process and possibly severe epistaxis by eroding the large vessels (usually venous) traversing just at this region: 1. Anteriorly, Superior Coronary or Nasopalatine; and 2. Posteriorly, Sphenopalatine.

INTERPRETATION

A. *Somatic[++] sensory nerve ends.* — Neurophysiologic "facts" provide a ready explanation for the success of "mechanical traumatization."

For example, similar success can be had with any of a number of other methods. They are all destructive and certainly more drastic than the one presented here. Clinical practices and experiences with therapeutic and preoperative (local anesthesia) uses of all kinds of agents to disrupt the continuity of nerves, at any point in their course, are factual: That these common practices can be and have been reduced to a simple and *harmless* method — adaptable because of the accessibility of a region — is truly within the ordinary bounds of imagination!

Because the ethmosphenoidal recess and posterosuperior region of the nasal cavity are not concerned with the "sneeze-reflex," these areas have never been treated nor has there been any need to do so.

B. *Autonomic nerve supply.* — It will be conceded that massage of the inferior turbinate, as described, directly affects the submucous glands — as well as the superficially-placed goblet cells — the cavernous sinuses, lymphatic vessels, et cetera. These effects point to a process of restoration of the inferior turbinate to its "normal" appearance and function. *No attempt is made to identify the role of turbinal massage on the sympathetic and parasympathetic nerves controlling these functions.*

MISCELLANEOUS CONSIDERATIONS

A. *Submucous Resection.* — Massage of the inferior turbinate is of value in the treatment of dysfunctions of this structure following submucous resections of the septum. Most commonly the turbinate of the previously non-obstructed side becomes turgescent and obstructive, annoying both the patient and the surgeon considerably. "Massage" has served as a good substitute with its minimum amount of trauma for such popular methods still practiced as linear-streaking of the inferior turbinate with galvanocautery tips; it definitely facilitates without additional surgical measure, the process of adjustment in the physiology of the mucosa to a sudden change in the structure of the internal nose.

B. *Allergy.* — 1. "Perennial" allergens have not been used to test patients as a matter of routine; also, in a few instances in which a typically decisive history was obtained that paroxysms of sneezing were induced by drafts of cold air and/or by stepping (from bed) onto a "cold floor" in the morning.

The patients of the latter group *without exception,* were found to prefer warm baths — *a choice of general habit rather than of any association between cold baths and attacks of sneezing:* Daily, "terminal cold showers" were prescribed in conjunction with intranasal therapy, starting with an exposure of a few seconds to cold water at the conclusion of a warm bath (shock therapy). This time was increased daily by five or ten seconds — until one or two minutes could be tolerated. Only the earliest cases received the combined empirical and desensitization treatments due to the fact that "traumatic-rubbing and massage" therapy was at best a half promise of relief in the writer's evaluation of it; for quite some years, each patient's response was a new surprise to the writer — now, *almost* a matter of fact. Further, desensitization against this physical allergen, in addition to its prominent role in the patient's history, did not involve innumerable, time-taking and *expensive* preliminary tests nor any subsequent series of injection treatments. Despite its practical application, it was discarded later without detracting from the success of the empirical treatment. Consequently, no positive statement is available in this report concerning the merits of treatment of physical allergy (investigations reported by Dr. Irwin Spiesman, Maywood, Illinois) affecting the nose.

2. "Seasonal" allergens have never been used to test for coexisting Hay Fever; such a diagnosis was determined entirely by a patient's history.

One patient was treated with practically no success by the writer's method during the first few weeks of his yearly and quite severe attack of Hay Fever. On two occasions, there followed an aggravation in the symptoms. This case corresponds in its lack of improvement to those cases of Hay Fever in which all kinds of caustics to the nasal mucosa[2] have been tried.

C. *Endocrinology.* — Thyroid extracts were used in one case: a male patient, aged 40, who had an acutely beginning attack (his first) of Perennial Vasomotor Rhinitis in November, 1937. Both sides of the nose were extensively

occluded by a diffusely pale, water-logged mucous membrane. There were frequent, relentless paroxysms of sneezing and hypersecretion — day and night — despite all forms of intranasal therapy. Because of his moderate obesity, after many negative tests for allergic factors and despite 2 normal tests of his Basal Metabolic Rate, it was insisted that the Internist who had made these examinations administer thyroid extracts, "Empirically," to the patient.

The relief in the severity of the nasal symptoms was almost immediate and a "cure" was finally admitted after continued abeyance of symptoms for 4 or 5 months. On two occasions, when it was necessary to interrupt medication, the nasal disturbances returned. Later, in 1940, another severe episode occurred but ended within a short time to the same treatment.

D. *Psychosomatology.* — There is no need to introduce, other than to mention the increasing number of investigations of so-called Allergic states or dysfunctions — in this field, of Asthma and Hay Fever but not of Perennial Vasomotor Rhinitis — being reported by psychiatrists and psychoanalysts. More than a suspicion exists that Allergy, Endocrinology and Psychosomatology are integral units in the pathologic-physiology of this group at least.

The writer is impressed by the high degree of incidence of a multiplicity of "conflicting" situations and its enterprising associate, "Psychoneurosis" (high tension), among patients suffering from Vasomotor Rhinitis.+

SUMMARY

1. A practical method for treating effectively Perennial types of Vasomotor Rhinitis, without resorting to expensive or complicated tests and instruments, has been reported in detail.

2. Technic; immediate effects; absence of complications; duration of results: are described with the simplicity of the method itself.

Four cases are discussed briefly for their categorical values. All others — the basis for this report — have been presented, instead, as a group of selected cases which were found to respond uniformly and favorably in the experience of the writer.

3. Although it was thought at first to retain strictly the clinical and "empirical" design of this report by refraining from interpretive statements, some attention had to be directed to the closely allied matters concerned with Allergy, Endocrinology and Psychosomatology. The prospect that these will eventually become coordinated in evolving basic methods of clinical and practical value — more so than exists today — is decidedly promising.

CONCLUSIONS

It is too dogmatic perhaps to state that the above method is effective therapeutically with few exceptions; that it involves no danger of complications. But because there is no danger, plus the slightest expense and utmost simplicity in the technic, there should be no objection to a concerted study of the foregoing.

+Acknowledgement is gratefully made to Dr. Joseph C. Beck — by whose virtue of inspiring story-telling from an inexhaustible life-time of experiences — it was the author's privilege indeed (at one of these fascinating conferences in 1932) to receive an idea from "Dr. Joe" regarding Professor Canfield's (University of Michigan) experience with turbinal massage. It referred to a chapter on "Nasosexual Relations," in Parsons Schaeffer's book, "Nose and Paranasal Sinuses." Added to this, the writer's interest in Psychosomatic Medicine in Otolaryngology about which his case-presentations and discussions finally encouraged the recognition of the significant extent of interrelation between these branches of Medicine: The first patient upon whom the present method was used presented extensive hyperplastic changes of the nasal mucosa and symptoms of "Hyperesthetic Rhinitis" as well as admitting in the history a number of marital conflicts. With an idea of curiousity to observe personally any of the relationships and effects stated above, the writer massaged the inferior turbinates of this patient. Neither in this case nor in any other has such a relationship been observed grossly. But, in this case, as well as in subsequent cases after the manner described the nasal mucosa changed in appearance to quite normal and the symptoms were relieved.

++The term, "Somatic," is used in its clinical sense, rather than morphologic or physiologic, to identify it sufficiently from the "Autonomic" (nervous system).

1. "Massage" was included at the writer's suggestion to Dr. A. R. Hollender among his (A.R.H.) "Physical Therapeutic Measures in Otolaryngology," A. R. Hollender, Publ. C. V. Mosby Co., St. Louis, 1937, p. 179.
2. After discussing the present report with Dr. S. Pearlman of Chicago sometime ago, he suggested future studies regarding the limitations of the foregoing method: (1) in infants troubled with nasal blockage; and, (2) in patients suffering from Hay Fever. In the latter, Dr. Pearlman considered whether it might be possible to reduce the severity of symptoms of "Hay Fever" patients at the height of the pollen season by preseasonal "traumatic-rubbing and massage."

30 N. Michigan Avenue

DISCUSSION

Dr. Samuel J. Pearlman, Chicago: Dr. Fishman asked me several weeks ago to discuss his paper, and I regret that in the interval I did not have sufficient time to try out a number of cases of my own, to prove the efficacy of his suggested method. Apart

from this, may I say the reading of his paper came as an agreeable surprise. We all know the increasing problem of vasomotor rhinitis. We all know that a fair proportion respond to usual methods, but certainly the work involved in testing by allergens is often great.

There are other methods we use — removal of polyps, metabolic investigations, elimination diets, etc., of which Dr. Fishman spoke. There nevertheless remains a fair proportion in which the most of the methods we use seem to fail. Furthermore, from time to time patients disappear from treatment and do not return for months or years. When they do, we are often surprised to find that the condition has disappeared spontaneously. There seems to be a fairly high incidence, as in asthma, of spontaneous recoveries.

Nevertheless, Dr. Fishman's method is refreshing and from this point of view, it is empiric. It is not wrapped in any theory. He merely gives us an example of what has been done in medicine throughout its history — "I do this thing, and I do not know why, but the patient improves." I am going to be interested and will try this method for myself, particularly because there are no unusual claims made for it. There are, of course, other methods of traumatizing the mucosa, and one may expect under all of these circumstances to see some improvement because of this traumatizing of the membranes in one way or another.

Dr. George Woodruff, Joliet: I would like to ask Dr. Fishman to outline his technic again.

Dr. Joseph C. Beck: — It would be a little unkind not to respond when Dr. Fishman called my name. I just walked in about that time and so I really did not hear the paper. From the discussion of Dr. Pearlman, however, I would like to have the chance to say something about the subject. I think Dr. Fishman's reference to me came from one of our conversations. A young woman was treated by a Rhinologist who massaged the turbinates for intumescent rhinitis and as a result of this treatment the patient became highly neurotic. The treatment was discontinued and the result of that treatment was practically negative on the intumescence.

Dr. L. Z. Fishman, Chicago (closing): I am most grateful to Dr. Pearlman for his interest and for his discussion of a sort of empirical thing, despite the fact that he was not given sufficient time in advance to make his own observations. We must recognize and commend Dr. Pearlman's open-minded attitude and his encouraging remarks today as a sharp contrast to that group of *clinicians* who affect "Therapeutic Nihilism" in order to play the role of *scientists* — in reality, a pseudoscientific pose.

I wish to thank Dr. Beck for relating the story that motivated this study in 1932. I had not intended to mention it until the moment when Dr. "Joe" entered during my presentation. As stated then, it is my privilege and pleasure to ackowledge Dr. "Joe's" responsibility for my interest — of which he is aware now for the first time. I hope that Dr. Beck will have no regrets. (The above circumstances will be added to the original manuscript). Unfortunately, Dr. Beck's story about "Nasosexual Relations" were never confirmed, because it would have been of considerable scientific interest to us. Dr. "Joe" — no danger exists, therefore, of providing these patients with a substitute for that biologic necessity to which you indirectly referred. Further, no addiction to cocaine is possible because, in no instance, has it been necessary to treat patients for more than a few weeks, *at intervals of 4 to 5 days.*

Dr. Woodruff's request to repeat the technic permits me to emphasize again that these details, from the experiences of a few who have used the method, must be decisive factors in the type of response obtained. For example, Dr. Irwin Spiesman has been able to obtain uniformly successful effects by using this treatment in selected cases of Perennial Vasomotor Rhinitis. A few of our younger members of the Department of Otolaryngology at the University of Illinois also report successes. On the other hand, Dr. Francis L. Lederer, Head of the above Department, has repeatedly told me of his failures with the treatment, particularly that his patients complained of a considerable amount of pain during the treatment. I use solutions of cocaine exclusively for topical anesthesia and do not conduct the various parts of the treatment for a *moment* when pain is experienced by the patient; certain patients, as we know, require more careful attention in obtaining local analgesia than others. Dr. Woodruff, "traumatic-rubbing" is restricted to the upper straits of the anterior half of the nasal mucosa, even approaching the roof of the nasal cavity when marked septal deviations are not present to prevent the latter. Each of the points to be treated, as described, requires about one-half minute. The mucosa of the inferior turbinates is *not traumatized* except at the few small points where the applicator is applied firmly and with considerable pressure against the turbinal bone. When "massage" of the mucosa is actually being executed, it will be seen to "wiggle" for a considerable length of the turbinate. When this movement is not elicited, either the technic is faulty or the mucosa is firm and therefore does not require the type of treatment which is being used to reduce turgescence and/or *grossly* hyperplastic tissue.

Well done is better than well said.—*Benjamin Franklin.*

RATIONALE OF INTRAVENOUS FLUID THERAPY

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Seventy per cent of the body weight consists of water and although nature never intended that man should be watered and fed by the vein when his bodily functions are normal, the ability to supply water, food or drugs by vein when needed constitutes one of the most significant advances in modern medicine. The use of intravenous infusions is not a modern procedure. Historically it anteceded the development of hypodermic injection. The first intravenous injection in man appears to have been performed by Sir Christopher Wren, in 1657. By means of a quill attached to a small bladder, he injected vinum emeticum into the vein. In 1668, several other physicians[10] reported the use of intravenous injections with a great variety of drugs, but these were followed by accidents, with the result that the practice fell into disrepute. At the beginning of the nineteenth century, interest in the subject was renewed and from 1802 to 1822 there was a periodical devoted exclusively to intravenous therapy. The boldest investigator of this period was Hale, who succeeded in injecting into himself intravenously half an ounce of castor oil. Fortunately, he survived, and came to the conclusion that all intravenous injections should be abandoned. In 1830, Joenichen is said to have been the first to use saline solution intravenously, and in 1891 Matas reported a series of cases of shock and hemorrhage in which the intravenous use of saline solution proved to be of some value. During World War I, the intravenous administration of fluids came into general use and since 1920 has become the method of choice of administering fluids on the majority of surgical services. But notwithstanding its widespread use in the past two decades, certain questions, especially as to the amount of fluid to be administered, the type of fluid to be used, and the rate of injection have been the subject of controversy, much of which could be settled by application of the knowledge of water metabolism. Therefore, before considering the water requirements of the sick patient, the type of fluid suited to each patient and the indications for intravenous fluid therapy, it is proper to review briefly a few basic physiologic facts concerning the metabolism of water.

Water Metabolism. — The modern conception of water metabolism centers about the term water balance. By this is meant the ratio of water which enters the body to the total amount of fluid which leaves the body. Under normal conditions, water becomes available from the fluids drunk and the food eaten. Fluids drunk vary from 800 to 2000 cc. per diem. The water in the food is derived from two sources, the actual content of water in the food itself, which on a routine maintenance diet equals 1000 cc. or 70 per cent of the total weight of the food, and the water formed as result of the oxidation of foodstuffs, which averages 500 cc. In other words, each gram of solid food ingested yields approximately 0.9gm. of water or about 1 cc. of water per calorie of food intake.

Loss of water from the body takes place by three mechanisms, namely, it is excreted by the kidneys, it is vaporized by the skin and lungs, and it is eliminated through the intestine. In the absence of diarrhea the fluid loss in the stools is negligible since it does not exceed 150 cc. daily. When it is realized that the upper half of the gastrointestinal tract receives fluid secreted as saliva, gastric juice, bile and succus intericus in the volume of 7000 to 10,000 cc. in twenty-four hours, the loss of scarcely 150 cc. of water in the feces demonstrates the indispensable function performed by the lower portion of the gastrointestinal tract.

The water lost from the skin and lungs varies with the temperature and the relative humidity of the atmosphere, and, with the extent of physical activity indulged in by the individual. In comfortably cool surroundings, the vaporation through invisible perspiration from the skin and the exhaled air from the lungs varies from 1000 cc. to 1500 cc. daily, which has been estimated[9] to be equivalent to 25 per cent of the dissipated body heat. The remaining 75 per cent of the body heat is dissipated by radiation, conduction and convection from the body surface, but the effectiveness of such mechanisms steadily decreases as the temperature of the environment increases. Thus in hot and humid surroundings the skin and lungs dissipate more than 25 per cent body heat which means that more than 1500

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cc. of water is lost by vaporization. This phenomenon is explained by the fact that the process of vaporization is affected very little by the amount of water available. The thermal regulatory mechanism utilizes whatever amount of water is needed to maintain continuous vaporization with the result that if water is deprived for long periods of time, the urine output is diminished or may cease although some water continues to be vaporized from the skin and lungs. Since the vaporizing process takes precedence over the urine output, a small volume of urine of high specific gravity indicates insufficient water. Normally the kidneys excrete 1000 to 1500 cc. of water daily, depending somewhat on the amount of excess fluid available and upon the quantity of waste material to be excreted. When the renal function is normal, an output of 500 cc. of urine in twenty-four hours may suffice to excrete 35 gm. of waste products, which is the minimum daily amount placed for removal by the kidneys.[6] One gram of waste material needs 15 cc. of urine with a specific gravity of 1.031. When the renal function is impaired as shown by scanty urine of low specific gravity (1.010 or lower), proportionately larger quantity of water is needed if retention of waste products is to be prevented. In other words, as the concentrating capacity of the kidneys decreases, the volume of urine should increase. For all practical purposes, a urine output of 1500 cc. in twenty-four hours will usually take care of the excretion of waste products by kidneys of all ranges of function. In the absence of diseases of the kidney or urinary tract, the so-called toxic suppression of kidney function not infrequently represents an abnormal reduction in the available water.

Water Requirements. — Coller and Maddock have shown that to provide water for vaporization and a good urine output an uncomplicated surgical patient requires approximately 2500 cc. of water in twenty-four hours, 1500 cc. for vaporization and 1000 cc. for urine formation. If the weather on the day of the operation is particularly hot, loss of water by these routes may be even greater. In the patient with fever, sepsis, or hyperthyroidism loss of fluid by evaporation is increased to about 2000 cc. per day. Moreover, the septic patient should excrete more waste material and the volume of urine should, therefore, be 1500 cc. making a total of 3500 cc. of fluid that must be supplied. Other losses of water may occur by abnormal routes, such as vomiting, gastrointestinal drainage (Levine tube, Wangensteen suction), hepatic bile, intestinal fistula, suppuration or loss of blood during operation all of which may average another 1000 cc. Thus the total loss of fluids may reach 4500 cc. If in addition to this the patient were dehydrated before operation, an even larger amount of fluid would be required. Usually the common clinical signs of dehydration are not manifest until the depletion of water amounts to 6 per cent of the body weight. For example, if the dehydrated patient weighs 55 Kg. (121 lbs.), the water requirement for the first twenty-four hours would be 6 per cent of 55 Kg. or 3,300 cc. of water in addition to the basic requirement of 3,500 cc. for vaporization and urine formation, which would make a total of 6,800 cc. The water constituting the 70 per cent of the body weight is divided as follows: 45 per cent in the intracellular fluid, 16 per cent in the intercellular fluid and 9 per cent in the blood. In dehydration, the fluid content of the intercellular spaces is the first to be affected. A marked diminution of the interstitial fluid causes a breakdown of body tissues with the result that the patient loses weight, feels thirsty and exhibits such clinical signs as dry buccal mucous membranes, dry hot skin, a beefy tongue, sunken eyes, slight fever, and oliguria. If the breakdown of body tissues fails to provide enough water for the maintenance of a normal volume of circulating fluid, the decreased circulatory flow causes a disturbance in the acid base equilibrium, an increase in the non-protein-nitrogen of the blood, cyanosis and other evidences of toxemia. It is not surprising then, that several liters of fluid are required within the first twenty-four hours by the severely dehydrated patient. Once the internal chemical balance has been restored, 2500 cc. of fluid will be sufficient to maintain a normal water exchange. The amount given should depend upon an accurate appraisal of each patient's requirement. In patients over 60 years of age, the quantity of fluid should be somewhat less than the total amount calculated in terms of body weight because their cardiovascular apparatus is not likely to tolerate much fluid well, especially if pulmonary congestion is

present. In children, on the other hand, there is a greater susceptibility to the deleterious effects of dehydration not only because they have a greater percentage of water in the body as a whole, but because they have a relatively larger volume of intercellular fluid. The younger the child, the greater may be the loss of fluid in terms of per cent of body weight. For infants of two years of age or less with symptoms of moderate dehydration, as much as 100 cc. of water per kilogram of body weight may be required to restore the fluid balance, while in children more than 3 years, 40 cc. per kilogram of body weight may be adequate. Naturally, these values are only approximations and achievement of a satisfactory state of fluid balance must be determined clinically.

TYPES OF FLUID AND THEIR EFFECTS

Normal Saline Solution. — One thousand cubic centimeters of normal salt solution contains 8.5 gm. of sodium chloride and the average daily ingestion of this salt varies from 6 to 10 grams. Therefore, if 3500 cc. of isotonic saline is administered in twenty-four hours, the patient receives close to 30 gm. of sodium chloride or three to four times more than its normal daily intake. While such large amount of salt is easily excreted by healthy individuals, in a postoperatively sick patient it may be harmful to the kidneys. Aside from the possible impairment of renal function, the intravenous administration of superfluous amounts of salt solution by diluting the colloids in the blood stream, may cause a decrease in the osmotic pressure and an increase in the hydrostatic pressure with the result that salt is diffused into the tissues and excessive water retention occurs. The reason why postoperative edema is not so commonly observed is because the patient who undergoes an ordinary major operation is usually given saline infusions for a day or two only, but if, either on account of a stormy and prolonged convalescence or other reasons, intravenous therapy with saline solution is continued for three or four days, subcutaneous edema may be noted, especially in the region over the back. In the presence of prolonged starvation, general malnutrition, sepsis, serous drainage, severe hemorrhage, malignancy of the gastrointestinal tract or impairment of the hepatic function, edema may occur from nutritive deficiency. This is especially true if the plasma protein concentration falls from the normal of 7 to 7.5 gm. per hundred cubic centimeters to 2.5 per 100 cc. for serum albumin and 5.5 or lower per 100 cc. for serum protein.[8] Nevertheless, sodium ions and water must be present in order for edema to develop. Keith has shown that it is not the chloride but the sodium radical that causes water retention and that if sodium is substituted by potassium, edema does not occur. So far, however, the general use of simple potassium chloride solution for intravenous fluid therapy is not recommended. From the foregoing statements regarding sodium chloride, it should not be inferred that the parenteral use of normal salt solution should be discarded. However, the widespread tendency to employ intravenous saline infusions routinely regardless of whether or not electrolytes are needed should be discouraged.

The intravenous use of saline solution should have more or less specific indications and of these there is a considerable number, medical as well as surgical. High intestinal obstruction, persistent vomiting from any cause, acute gastric dilatation, gastric or duodenal fistulae, frequent gastric lavage, severe diarrhea, dysenteriae, pneumonia, Addison's disease, profound heat exhaustion and prolonged induced fever therapy are usually associated with a dehydration in which abnormal loss of chloride is a notable feature. To ascertain the existence of hypochloremia it is unwise to wait for the manifestation of its symptoms — drowsiness, weakness, fatigue, anorexia, nausea or stupor. Blood chemistry studies of the plasma chlorides usually help to arrive at a more accurate estimate of the electrolytes lost and, therefore, serve as a guide in determining the quantity of sodium chloride to be supplied. While it is difficult to lay down hard and fast rules to cover the proper administration of saline solution to all patients, investigators have shown[1] that for each 100 mgm. of plasma chlorides below the normal level (540-640 mgm. per cent), the patient should receive 0.5 gm. of sodium chloride per kilogram of body weight. For example, if the plasma chloride is found to be 440 mgm. per cent and the patient's weight is 60 kg., the calculation is made by multiplying 0.5 by 60 which equals 30 gm. of sodium chloride required. Repeated studies have shown that the administration of salt in greater amount than that provided by this rule will not elevate the level of

plasma chlorides materially but simply predisposes to the development of edema. This mathematic formula based on the observation of the plasma chlorides is especially valuable when considerable loss of gastro-intestinal secretions has occurred previous to admission to the hospital. In the hospital, the amount of secretions lost from the gastrointestinal tract can be measured and the sodium chloride and water replaced on a volume for volume basis with normal salt solution or preferably Ringer's solution, which is more nearly physiological compatible with blood. Ringer's solution is composed of 0.7 percent NaCl, 0.03 per cent KCl and 0.025 per cent $CaCl_2$. Because of the presence of small amounts of KCl and $CaCl_2$ there are a few less sodium ions in Ringer's solution than in normal saline which is 0.9 per cent. However, since the NaCl content in the vomitus and other gastrointestinal secretions lost is less than the amount present in an equal volume of normal saline or Ringer's solutions (see Table I.) and since the loss of chloride ions is generally greater than the loss of sodium ions, the replacement of electrolytes based on observation of the blood chlorides is a more accurate method and if properly utilized the probability of waterlogging the tissues with saline solution is avoided. In patients suffering from severe burns, even in the absence of clinical evidence of shock, the plasma chlorides often remains much below the normal level despite the administration of relatively large quanities of saline solution.

TABLE I. CONCENTRATION OF SODIUM CHLORIDE IN VARIOUS FLUIDS LOST

	Variation in NaCl Conc. Gm/Liter	Average NaCl Conc. Gm/Liter
Vomitus	1.2-6.2	3.3
Gastroduodenal drainage (Wangensteen suction)	1.9-7.9	5.7
Hepatic Bile	3.5-6.4	5.1
Intestinal fistula drainage	3.0-8.8	5.2
Diarrheal stools	3.7-5.2	4.3

Solution of Glucose. — Inasmuch as dehydration is more often associated with certain degree of starvation and ketosis rather than a hypochloremia, the likelihood of giving too much salt can be avoided by using half of the required amount of fluid as 5 per cent glucose in sterile distilled water. Five per cent solution of glucose supplies the necessary water and quickly available food. One thousand cubic centimeters of 5 per cent glucose yields 200 calories, and although such caloric value even if repeated three times a day would be far below the number of calories needed to make up the average daily energy requirement for an adult, in most instances of starvation it is sufficient to prevent ketosis. Besides starvation, impoverishment of hepatic glycogen is known to occur in any lesion of the gall bladder or liver, with or without jaundice. For this reason, intravenous infusions of 5 or 10 per cent glucose are not only indicated but almost indispensable both before and after operations on patients with long-standing diseases of the biliary tract. The same can be said in cases of thyroidectomy. In fact, there are very few surgical conditions in which the generous intravenous use of glucose is more important than thyrotoxicosis. In the absence of chloride loss, as by repeated vomiting, diarrhea or other abnormal routes, 5 per cent glucose in distilled water rather than in normal saline solution is better. Five per cent glucose solution alleviates thirst more readily than normal salt solution because glucose is quickly oxidized in the liver and releases water whereas sodium chloride tends to bind water. Notwithstanding the desirable properties of glucose it must be remembered that metabolic balance cannot be maintained very long by the intravenous administration of glucose, salt or any other intravenous solutions, so that patients must have food by mouth at the earliest possible time. When the patient is able to drink fluid, intravenous solutions are unnecessary. The idea of supplying more food by administering glucose solution of higher concentration than 10 per cent is not well founded because its diuretic effect may delay the restoration of fluid balance. Hypertonic solutions of glucose have a definite use, but it is rather limited. In certain brain injuries,[4] in the presence of edema, oliguria, anuria, or azotemia, solutions of 20, 25 or even 50 per cent glucose intravenously are specifically indicated. In the management of patients suffering from coronary occlusion with myocardial infarction, repeated intravenous injections of concentrated glucose solution may be helpful in relieving the dyspnea which is due to a diminution of glycogen content in the myocardium as well as to anoxemia.

Alkaline Solutions. — When dehydration is associated with severe acidosis, sodium r-lactate, one-sixth molar solution as such or combined

with Ringer's solution is better than normal saline or five per cent glucose solutions, either alone or in combination. It can be calculated that each 60 cc. of one-sixth molar sodium r-lactate per kilogram of body weight may increase the sodium ion concentration of the blood plasma about 14 millimols (mM) per liter. This corresponds to a rise in the bicarbonate concentration sufficient to yield an additional 33 volumes of carbon dioxide per hundred cubic centimeters of blood plasma. Thus racemic sodium lactate neutralizes acidosis more satisfactorily by virtue of the fact that after being metabolized in the body, it is gradually converted into sodium bicarbonate. However, the treatment of acidosis, even if moderately severe, is not by the administration of sodium bicarbonate solution intravenously, as might be expected. Indeed, this form of therapy is really dangerous because of the likelihood of bringing on a fatal alkalosis.[11] This is particularly true in children who may be in acidosis but who have also suffered a loss of base from the excretion of sodium in the urine and stools. Similarly, if the acidotic state has been associated with vomiting, there may be a coincident depletion of blood chlorides and consequently the administration of alkali intravenously would neutralize the ketones and quickly produce alkalosis. In view of these facts, sodium bicarbonate should not be administered intravenously except when the carbon dioxide combining power of the blood has fallen to 20 volumes per cent or lower. At this level a single intravenous injection of 500 cc. of 5 per cent sodium bicarbonate may be tried with little or no risk of producing alkalosis. In alkalosis resulting from intravenous injection of sodium bicarbonate or from vomiting in which there is loss of chlorides and marked dehydration, the patient should receive intravenous infusions of normal saline or preferably of one per cent sodium chloride solution until the acid base equilibruim is restored to normal. Success is dependent upon the ability of the kidneys to selectively excrete the excess base as bicarbonate, and not as chloride, until the acid base balance is reestablished. Intravenous injection of a 5 per cent solution of calcium chloride should be reserved only for patients in whom the alkali excess has reached the stage of causing tetany. In both, acidosis and alkalosis, the treatment of the underlying conditions is of prime importance. Therefore, the management of diabetes, urinary obstruction, anoxemia, circulatory failure, emphysema, morphine poisoning, sulfonamide excess and other probable causes of acidosis is indispensable. If alkalosis is due to excessive alkali ingestion, as in peptic ulcer, obviously the alkali should be discontinued.

Blood Plasma, Serum, Etc. While isotonic solutions of saline or glucose intravenously are indicated to prevent shock which may result from a severe dehydration, in shock due to hemorrhage or trauma these solutions of crystalloids may have an unfavorable effect because the volume and concentration of the plasma, already lowered as a result of concomitant damage to the endothelium of the capillaries, may be further decreased as the plasma proteins is rapidly extravasated along with the injected fluid into the intercellular spaces.[3] This is reflected by a rise in the hematocrit (hemoconcentration). Under these circumstances blood plasma or blood serum is ideal. Properly prepared human blood plasma can be given with no fear of serious reactions and without typing or cross-matching the blood of the recipient. Desiccated plasma is stable for long periods of time and the administration may be immediately undertaken by simply mixing it with pyrogen-free, sterile, distilled water. Restoration with whole blood is contraindicated in shock not accompanied by hemorrhage because the extra blood cells so supplied add to the hemoconcentration. Blood plasma is also useful in the treatment of the nephrotic syndrome which is characterized by edema and hypoproteinemia. For many years 6 per cent acacia solution was singled out as a suitable substitute for blood but subsequent experience revealed its shortcomings. Solutions of isinglass, pectin and gelatin have now been tried but experience with them has been rather limited.

PRACTICAL CONSIDERATIONS

Besides the quantitative and qualitative aspects of fluids, intravenous infusions involve certain practical considerations. Next to the adequate precautions in the preparation of the solution and apparatus, the responsibility of which is now largely carried by reliable commercial firms, the rate of injection is very important.

For simple fluid replacement, 50 to 80 drops per minute are well tolerated. This rate equals 300 to 500 cc. per hour and easily permits the administration of 2000 to 3500 cc. in a few hours. The estimated amount of fluid should be given preferably during the day so the patient is not disturbed in the course of the night. Except in cases of traumatic shock or hemorrhage in which prompt restoration of an effective circulating volume is desirable, intravenous fluid should not be administered too rapidly as it may cause acute cardiac dilatation, especially in patients with a cardiac defect. When using 10 per cent glucose, a slower rate of from 30 to 50 drops per minute (200-300 cc. per hour) increases its utilization and minimizes the "spilling over" into the urine. Hypertonic solutions of glucose frequently cause phlebitis or thrombosis at the site of injection. This is also an important consideration when repeated injections are necessary over a long period. The frequency of venous thrombosis following venipuncture may be appreciably reduced by injecting a few cubic centimeters of normal saline through the same needle in which the hypertonic glucose solution has been administered. If the venipuncture is rendered difficult on account of unusually small veins, a hot moist pack covering the arm, wrist and hand about half an hour before performing the injection may facilitate the procedure. Fortunately, the method of giving intravenous fluid by continuous infusion for twenty-four or forty-eight hours[7] has been practically discarded because it often caused a depletion of the plasma proteins, thrombosis and fatal embolism. A well spaced schedule of interrupted infusions of 1000 cc. is much safer.

SUMMARY

1. Extensive studies of the mineral and water metabolism of the body have made possible the safe and rational intravenous administration of relatively large amounts of fluid.

2. Dehydration, the most important indication for fluid therapy, may result from numerous causes, and the fluid requirement of every patient should be calculated and considered individually.

3. The intravenous use of saline or Ringer's solution is specifically indicated when the serum electrolytes is depleted, as by repeated vomiting, diarrhea, or other abnormal routes, but contraindicated over any prolonged period because of their tendency to produce edema.

4. In the absence of hypochloremia, the fluid of choice is a 5 per cent glucose in sterile distilled water.

5. In the treatment of dehydration associated with marked acidosis, the acid base balance can be more safely re-established by sodium r-lactate one-sixth molar solution as such or combined with Ringer's solution rather than sodium bicarbonate solution intravenously.

6. In the presence of circulatory failure due to reduction of blood volume, crystalloid solutions such as saline and glucose may not be relied on because they diffuse readily from the circulation. Under these circumstances the timely administration of plasma has a definite place in the armamentarium of intravenous fluid therapy.

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When Charles F. Kettering was doing research for the National Cash Register Company, he estimated that a certain project would require a year for completion. When asked to double his force and reduce the time to six months, his reply was: "Do you think that by putting two hens on the nest a setting of eggs could be hatched out in less than three weeks?" —*Peabody Journal of Education.*

OSTEOCHONDROSARCOMA OF THE BREAST

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Osteochondrosarcoma of the Breast is one of the rarest of all malignant tumors. Sailer[1] submits a resumé on carcomas of the breast from St. Luke's Hospital in New York and shows a ratio of one carcoma to 125 carcinomas; however none of his cases included an osteochondrosarcoma. William Battle[2] reported the first case in 1886 and the latest was reported by Freshman and Kirkland[3] in 1940. Raso[4] and Buser[5] both add to the present literature in reporting true osteochondrosarcomas. Some thirty cases of chondroid or osteoid types have occurred in the literature but probably only seven or eight of this mixed type have been reported.

CASE REPORT

Mrs. S. 43 years of age the mother of six children, the youngest less than one year of age, noticed a small hard nodule in her left breast about July 4th, 1941 following a severe contusion to this area. On October 4th, 1941 the breast was examined and a freely moveable mass was found in the upper outer quadrant about the size of a small hen's egg. The tumor was enucleated on Oct. 6th and a radical mastectomy was done on Oct. 8th. In gross, the specimen measured 7 x 5 x 3 centimeters which was extremely hard on section. There was a small cavity with a trabeculated lining near the center.

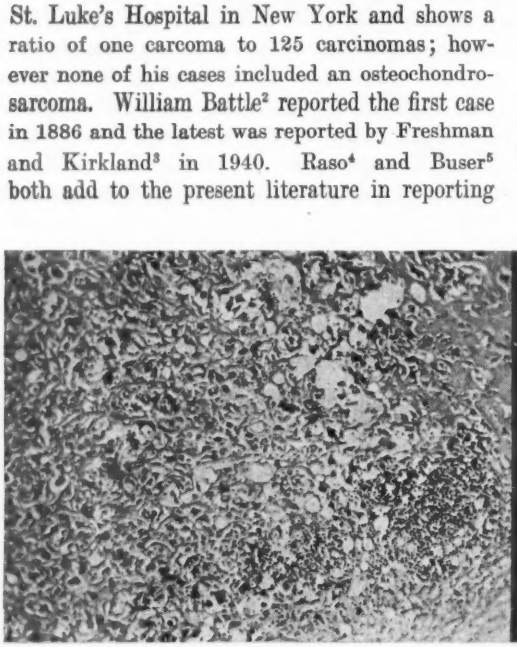

Figure 1

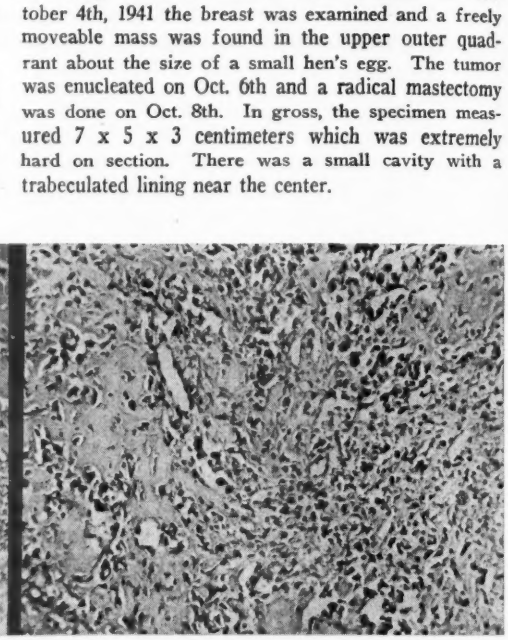

Figure 2

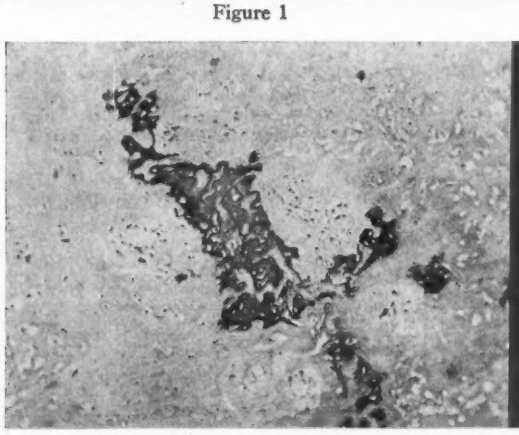

Figure 3

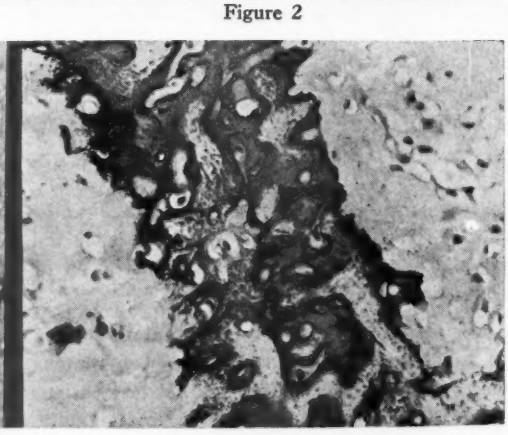

Figure 4

Figure 1. Periphery of mass with gland like spaces. Giant cells and collections of round cells. Hamatoxyl'n and eosin X125

Figure 2. Sarcomatous area with cartilaginous tissue. Hematoxylin and eosin X150

Figure 3. Deposit of calcium suggesting osteoid tissue embedded in cartilaginous matrix. Hematoxylin eosin X125

Figure 4. Osteoid tissue. Hematoxylin and eosin X375

Microscopic Description—Sections at the junction of the tumor with the remaining breast tissue reveal an abrupt transition with very little evidence of encapsulation of the tumor. The acini of the adjacent breast tissue are surrounded by a loose appearing myxoid tissue containing many round cell collections. The tumor tissue in places abuts on, or merges with, this myxoid stroma. Immediately adjacent to the transition point the tumor tissue is composed of numerous oval, spindle or polyhedral hyperchromatic cells in a hyaline matrix. Occasional multinuclear cells are noted. Some areas suggest acinus formation. In sections from deeper parts of the tumor fewer cells and greater amounts of hyaline stroma are noted with occasional collections of mucocollagenous tissue. The tissue is mostly acidophilic but occasional small areas of basophilic reaction are noted. These latter areas are considered to be cartilage. Deposits of calcium in several regions give the appearance of osteoid tissue.

DISCUSSION

In the majority of reported cases trauma seems to be the exciting agent as is quite apparent in this case. Females past the third decade have been affected in all reported cases.

The lymphatic glands examined showed no evidence of sarcomatous change. Therefore a complete recovery may be expected because the progress of extension is probably by continuity along the facial planes rather than by metastasis via the lymphatics or the blood stream.

Metaplasia or the transition of one tissue into another seems to offer the most plausible if not the true histopathogenesis of this type of breast tumor. Therefore the transition of connective tissue into giant cells and round cells at the periphery of the tumor and a gradual extension toward the center of sarcomatous and cartilaginous tissue and finally osteoid tissue near the center leads to our present supposition.

SUMMARY

1. An exceedingly rare type of breast tumor is presented which contained round cells in myxoid stroma, spindle cells, hyaline and mucocollagenous tissue and osteoid tissue or an osteochondrosarcoma.

2. Metaphasia is offered as a possible basis for the unusual histopathogenesis.

3. A complete recovery is looked for because of the probable means of extension and the type of surgery done.

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TETRACAINE SPINAL ANESTHESIA

A Review of 100 Cases in Private Practice

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Spinal anesthesia has become an accepted procedure and the reason for presenting this paper is to call attention to the use of tetracaine, a drug which is widely used in the eastern states but is little known in the central states.

Advantages—The principal advantages of tetracaine over procaine in rachianesthesia are: long duration of action and slight effect on blood pressure. It possesses, in common with all other spinal anesthetics the usual advantages over general anesthesia, namely: less toxicity, less shock, greater relaxation of abdominal muscles, increased tonus of intestines, less post-operative pain and vomiting, ability to take fiuids by mouth during and immediately after operation, and fewer pneumonias and atelectasias; it permits operating on patients whose pulmonary and cardiac conditions would not stand a general anesthetic.

Contra-indications—Spinal anesthesia has certain well known contra-indications. It is unsuitable for young children and those who have scoliosis, arthritic spines, meningeal irritation, shock, or infections over the spine. To these usual contra-indications should be added one other:—operations on the pregnant uterus. Here the relaxation leads to greater than normal hemorrhage.

General Considerations—

1. Dosage. The dose will depend mainly upon the level of anesthesia desired. The weight of the adult patient is of very little importance. For perineal or leg work fifteen milligrams of tetracaine are used, for all other abdominal work up to and including operations against the diaphragm, twenty milligrams will suffice. The dose is reduced only very slightly for smaller than average individuals.
2. Toxicity. No satisfactory method has yet been devised to determine the true toxicity of this drug. It is obvious that a lethal dose at the vital centers is only a therapeutic dose at lower levels. The giving of toxic doses intravenously cannot be used as a criterion of safety in the thecal canal.
3. Form of Preparation of Drug. Tetracaine is available in two different forms one being a one percent solution in two c. c. ampules the other a niphanoid crystal. A third form, a one-half percent solution was recently tried out but was unsatisfactory. The results herein recorded were all obtained with the one percent solution.

Pre-medication—The proper preparation of a patient for operation is of utmost importance. The night before operation six grains of sodium amytal are administered. The morning of operation one-sixth grain of morphine with one one-hundred fiftieth grain of scopalomine two hours and again one hour before operation are given.

Technique of administration—For perineal and lower extremity work the interval between the fourth and fifth lumbar spaces is selected. For pelvic work the interval between the second and third lumbar spaces is used and for all other work the interval between the twelfth thoracic and first lumbar or first and second lumbar are chosen.

The puncture is performed with the patient lying on the side. An important point in technic is to keep the shoulders perpendicular to the table while curving the spine. Some operators have the patient lie on the abdomen for ten minutes after administration in order to allow it to "float" to the sensory roots: this is unecessary.

Before making the injection the site is prepared as for any other operation, then fifty to one-hundred milligrams of ephedrine hydrochloride dissolved is one or two c. c. of one percent procaine solution is injected into the skin and subcutaneous tissue. The spinal needle is inserted and after a free flow of spinal fluid has been obtained the tetracaine solution is injected. Originally, considerable barbotage was practiced but more recently only a slight amount and in some cases none has been used. The best anesthesia is obtained where little or no mixing is employed and the injection is made fairly rapidly (about five seconds).

Following the administration of the drug the patient is at once turned on his back unless the dorsal position is desired. Anesthesia is complete in eight to ten minutes; then for fifteen minutes the table is kept flat and no pillow is permitted under the head. After this, any position may be used. From the start the anesthetist records the blood pressure every five minutes and reports on it if at any time it drops more than twenty millimeters of mercury under the normal for that individual.

A nasal catheter is inserted just inside of the nostril and pure oxygen is administered at the rate of three to five litres per minute. Any discomfort ordinarily encountered with spinal anesthesia is due to anoxemia of the peripheral tissues. The administration of oxygen overcomes this, and, since its introduction, it is rare to have a patient complain of any feeling of suffocation or nausea. If either of these symptoms are noted the anesthetist increases the flow of oxygen to five or six litres per minute for a few minutes.

Certain stimulants must be present. This applies to all anesthetics. A sterile syringe and needle should be ready with one ampule each of coramine, epinephrine and ephedrine hydrochloride. In this group of patients it has only been necessary to resort to stimulants twice.

The ages of the patients covered in this report varied from fourteen to seventy years. The lowest first blood pressure recorded (before giving ephedrine) in any case was ninety, the highest was two-hundred. The time for which blood pressure readings were taken at five minute intervals varied from twenty minutes to two hours and fifty-five minutes. The duration of

actual operation varied from ten minutes to two hours and forty-five minutes. There was one chest operation, twenty-seven upper abdominal, seventy lower abdominal and two lower extremity.

Exact records of the blood pressure were kept at five minute intervals in the last seventy-eight of one-hundred consecutive anesthesias. The lowest that any blood pressure dropped to during operation was seventy-eight millimeters, the highest that any of them rose to was two-hundred and twelve millimeters. The greatest drop of blood pressure in any one in this group was thirty millimeters of mercury which occurred ten minutes after the anesthetic had been given. No treatment was given and the blood pressure steadily rose, ending at ten millimeters of mercury above the starting pressure.

As to post-operative complications they were as follows: atelectasis and pneumonia none. Deaths—three. These were in no way attributable to the anesthetic, one patient who had a cholecystectomy died on the twelfth day of myocarditis, one patient who had a gastric resection died on the fifth day of myocarditis, and one patient who had acute cholecystitis died on the fourth day of cholemic coma; post-mortem examinations were obtained in each case.

Headache of any marked degree has occurred only once. Peculiarly enough, it was in a patient operated for bunions. She received a smaller dose of tetracaine than usual and her position was not changed on the operating table. Backaches have been absent. This compares very favorably with the fifteen to twenty percent who complain of severe backaches after general anesthesia. There was a noticeable absence of nausea and vomiting in all of this group, only six having any emesis recorded.

Spontaneous peristalsis has been present in all cases except in the patient who died of cholemia. As a routine, a one pint saline or soapsuds enema has been given on the second post-operative day and this has invariably been sufficient to permit evacuation. Difficulty in urination was encountered once. This was following a herniotomy and is of course a common occurrence in this operation.

It has been necessary to supplement the anesthesia in two cases, both of which were prolonged and difficult operations. One case was a combined abdominal-perineal-rectal-resection; the other was a resection of the terminal ileum, cecum, ascending colon and half of the transverse colon. In the first of these cases a supplemental anesthesia was not necessary because of any pain of operation but purely from discomfort to the patient at being placed in the "jack-knife" position for the second portion of the operation. The second case felt pain after the operation had been in process about one hour when the transverse meso-colon was handled.

Several other patients were given a small amount of gas in the early stages where the preliminary narcosis had either been insufficient or had had insufficient time to act. After about five minutes, gas was discontinued and the patient would stay in normal sleep throughout the operation, or if they did awaken, would be calm.

The question of patients fear of a spinal anesthesia has been broached numerous times. If they have confidence enough to permit their surgeon to operate on them, then they also have confidence enough to permit him to choose what he believes will be the most suitable anesthetic. In every case where a patient has had ether at a previous operation and then rachianesthesia they have expressed the opinion that they prefer the latter. This information is very often volunteered. One patient in this group received three spinal anesthesias and two others received two while still in the hospital, and in none of these was there any request for a change.

SUMMARY

Spinal anesthesia with tetracaine is highly satisfactory and is of sufficient duration for practically all procedures. Adequate pre-operative preparation of the patient is a necessity and adds greatly to the safety and comfort of the individual. In this group of patients, no marked changes in blood pressure were noted and post-operative complications and morbidity were minimal. Anesthesia is of two to three hours duration.

CONCLUSIONS

In tetracaine we have a valuable addition to the available drugs for anesthesia.

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1. The tetracaine used in this work was Pontocaine as supplied by Winthrop Chemical Company.

HEPATOMEGALY AND ASCITES IN UNDULANT FEVER

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The variety of local and general manifestations of undulant fever are well known to the profession because of their excellent description in the reports of Hardy,[1] Bierring,[2] and Simpson.[3] It is, however, of interest that in a total of 365 cases analyzed by these clinicians only sixteen had palpable hepatomegaly, and no case was complicated by the existence of ascites or other clinical findings indicative of liver damage. In contrast, brucellosis seen in the Mediterranean and other areas of Europe has been described by Rimbaud and Serre[4] as "a visceral malady, in which hepatomegaly is one of the most common manifestations of this tendency." In addition, Puig[5] has shown that liver enlargement is often associated with either a purpuric clinical picture, or with that of portal hypertension, i.e. ascites. The purpuric[5] form results probably from generalized vascular damage, as pointed out by Eyre,[6] and is characterized by hemorrhages into such areas as the intestines, spleen, kidneys, lungs, skin, lymph nodes, and subperitoneal connective tissue. The ascitic[5] form is less common and is usually more serious. A history of alcoholism was present in some of these patients, but the absence of post-mortem studies leave the question of the relationship of a pre-existent cirrhosis to the acute clinical picture unanswered. This question has been examined by V. Albertini and Lieberherr,[7] and we shall have opportunity to refer to it later.

REPORT OF A CASE

M.P., white male, age 25, hog butcher at the stock yards, entered the Cook County Hospital on 12-31-40, and gave a history of having become ill on 11-8-40 with a cough, fever and sweating. His family physician made a diagnosis of pneumonia, and treatment consisted of about twenty "white pills," presumably a sulfonamide. In the course of a few days, the patient was apparently improved. However, in a short time, fever and sweating returned, and the patient became progressively weaker, short of breath upon exertion, and a skin pallor was noted. At about the same time, the patient noted a slow generalized swelling of the abdomen, which increased as time went on. Pain was absent.

On a few occasions, he expectorated a blood tinged sputum.

About three years before the present illness, he drank whiskey heavily (¼ to 1 pint daily) for a period of six months. Physical examination revealed a thin white male, with marked pallor of the skin and mucous membranes, subicteric tinge in the sclera; T. 102.2° F., pulse 132, respirations 32, B.P. 114/80 mm Hg; no lymphadenopathy, no purpura. Heart Neg; lungs — suppression of breath sounds in both bases, and a few medium moist rales. Abdomen: Distended and tense, shifting dullness; liver ballotable four fingers below right costal margins; spleen impossible to explore on account of ascites; no edema of the lower extremities.

Table I*

Blood Date	Hb	RBC	WBC	Differential
1-2-41	55%	2.69	5100	(Red cells characteristic of (a normocytic anemia 78% (poly, 20% lymph, 2% (mono.
1-10	—	3.42	4250	
1-14	56%	3.18	2400	45% " , 40% " , 5% mono.
1-24	—	3.40	2700	
1-27	—	3.54	3650	
1-31	75%	4.13	4350	
2-4	80%	4.16	5450	
2-7	85%	4.36	5900	47% " , 44% " , 7% mono.
2-13	85%	4.58	6400	

*Blood transfusions of 500 cc. — 1-21, and 1-24.

Laboratory Findings. Table I shows the course of the blood picture.

Blood chemistry showed normal content of non-protein nitrogen, glucose, phosphorus, phosphatase, and cholesterol. Total protein measured 8.71%. The icteric index was fifteen. Blood agglutinations were positive to Brucella Abortus in 1/320 dilution and to Brucella Suis in 1/2560. The blood yielded Brucella Suis upon culture.

X-ray of the chest and the electrocardiogram were essentially negative.

Peritoneoscopy (Dr. Frank de Trana) showed the liver to be enlarged and down about three centimeters below right costal margin. Its surface was smooth and there was no external evidence of cirrhosis. The spleen was markedly enlarged. The peritoneum appeared normal. The examiner thought that the possibility of portal vein thrombosis should be considered.

Five thousand cc. of a clear yellow fluid was removed and was found to have a specific gravity of 1.010. A biopsy study of the peritoneal fluid showed it contained many lymphocytes, and a few mesothelial cells. No bacteria were found. A specimen sent for culture was lost.

The hippuric acid and galactose tolerance tests for liver function were essentially normal. Table II shows the blood galactose values following the administration of forty grams of galactose orally.

A sternal smear made during the third week of hospitalization was found to be essentially normal.

Table II

	Mg % of Blood Galactose		
Fasting	30	60	90 minutes
0	44.5	16.2	0

Course: The patient's general condition improved in response to two blood transfusions. However, lysis of fever did not occur until after the start of the sulfanilamide (Table III). The dose was 90 grains daily for three days, and then 60 grains daily until it was discontinued eight days later. Because of the severe secondary anemia, and the possibility that it was due to the earlier administration of a sulfonamide, we had felt it unsafe to use the drug until there was an improvement in the count. Table I shows that it was unaffected by the second course of the drug.

Hepatomegaly and ascites: Following the removal of fluid on 1-6-41, there was no re-accumulation of fluid. The liver, however, remained about the same size until chemotherapy was started, and then it gradually diminished in size so that about three weeks later it was one finger below the costal margin. Three months later, it was normal in size.

Anemia: The blood picture was typical of a normocytic anemia. Table I shows that the count rose gradually from the date of admission, but accelerated after the transfusions.

Comment: The clinical picture of this case of porcine brucellosis had as its outstanding features: Hepatomegaly, ascites, and a severe secondary anemia. A brucella suis septicemia was still present two months after the date of onset.

Hepatomegaly and Ascites: Both European and American workers (1, 2, 3, 4, 7, 8, 9, 10) have emphasized the general nature of undulant fever, pointing out that the findings in the host depend upon the reaction of the reticuloendothelial system to the infection. Usually, the stimulation is severe enough to produce granulomatous lesions simulating tuberculosis. These are found in the spleen (78%), liver (68%), kidneys, lymph nodes, bone marrow, and subcutaneous structures. Central necrosis of these lesions, although infrequent, may occur, and then the resemblance is to Typhus. A diffuse exudative inflammatory process in the liver was found in some cases. On the other hand, the absence of specific lesions has been noted, where death may have been induced by some pre-existent disease.

Von Albertini and Lieberherr,[7] in their review of the post-mortem studies in Germany, including several of their own cases, noted that evidence of previous liver damage was often present in those cases which showed the most extensive liver damage at autopsy. It was, therefor, impossible for them to conclude that undulant fever alone was capable of producing the clinical picture of cirrhosis. Our case supports this idea, — that a previously developed liver fault is probably necessary for the development of sufficient liver damage to result in the clinical picture of portal hypertension. Unfortunately, the hippuric acid and galactose tests were of no help on this point. It is interesting to note that the peritoneoscopic examination suggested the possibility of a portal vein thrombosis, but we are inclined to feel that if such were the case, recovery from the ascites would not have been as rapid.

Table III

Daily temperature peaks.

Admission day: 102.2° F.

January

1. 101.2	12. 101.8	23. 99.0
2. 101.2	13. 100.6	24. 100.6*
3. 100.8	14. 100.0	25. 99.0**
4. 102.0	15. 101.4	26. 101.4
5. 101.4	16. 103.0	27. 99.2
6. 101.6	17. 101.6	28. 98.0
7. 101.0	18. 101.6	29. 98.4
8. 102.0	19. 100.6	
9. 100.2	20. 101.6	
10. 101.0	21. 99.4*	
11. 100.6	22. 100.0	

Afebrile to discharge 2-14-41

*Transfusion
**Start of sulfanilamide.

Anemia: Moderate anemia is not unusual as a complication of undulant fever. It may be explained as being due to either the hemolytic action of the infectious agent, and in some instances, to hemorrhages into such tissues as the lymph glands, spleen, kidneys, intestines and lungs. (Sprunt and McBryde[10]). The finding of granulomatous invasion of the bone marrow, in some cases, may explain the development of anemia on an aplastic basis. Eyre[6] described these lesions in 1908. The sternal smear in our patient would not warrant a diagnosis of a bone marrow etiology. Another possible cause might be a deficiency of the liver store of the red cell maturation factor. We have considered the likelihood of a sulfonamide hemolytic action, but the absence of a destructive response on the second administration of the drug lends no support to this possible cause.

Response to therapy: The immediate improvement in our patient following the administration of sulfanilamide indicates that the result was more than a coincidence. Recently Kind and Lucas[11] pointed out that brucella suis was more susceptible to sulfapyradine than were the other brucella. However, we are fully aware of the fact that the results with sulfonamide therapy are not always so encouraging.

CONCLUSIONS

1. A case of porcine brucellosis with marked hepatomegaly and ascites has been described. The relationship of previous liver damage to the development of portal hypertension was discussed.

2. Marked secondary anemia was present and its melitococcic pathogenesis was considered.

3. Complete recovery followed sulfonamide therapy. After three months there had been no recurrence.

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THE TREATMENT OF HYPERTENSION WITH POTASSIUM SULFOCYANATE

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The use of sulfocyanates in the treatment of hypertension has become more popular since Barker's[1] introduction of a practical method for determining the blood sulfocyanate level and his demonstration that the drug may be used safely and effectively in controlled cases. The use of the drug had previously fallen into disrepute because of the frequency of severe toxic symptoms and even deaths accompanying its use.

In 1939 we decided to determine if the sulfocyanates could be used safely and effectively in the treatment of hypertensive patients seen in private practice using laboratory facilities available in the average community. Previous to that time all of the reports had appeared from large clinics and teaching hospitals having unlimited laboratory facilities and where the expense to the patient was of no necessary consideration.

The group of patients to be reported included 19 unselected cases of hypertension with systolic blood pressures remaining above 200mm. and diastolic pressures above 120mm. on the usual forms of therapy such as theobromine, nitrates, sedatives, etc. All had been observed for a period varying from three months to three years before the sulfocyanates were administered. Such a control period should remove the factor of

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suggestion from the evaluation of results. A few other patients have been studied but are not included in this report because of too short a period of observation or the admitted laxity of the patient in taking the drug as prescribed.

During the early months of the investigation no attempt was made to select cases other than that they had been observed over a sufficient control period and that their systolic and diastolic pressures were not below the minimum indicated above. As a result we have included five patients with severe renal damage as shown by marked albuminuria, elevation of non-protein nitrogen and decreased phenolsulphonephthalein excretion. At the onset we purposely included these cases in an effort to study all possible toxic and therapeutic effects in every type of case. During the past year such individuals have not been given sulfocyanate because of the unsatisfactory results obtained in this type of patient. Before treatment was started all patients were thoroughly reinvestigated for evidence of cardiac and renal damage. Aside from the usual physical examination and urinalysis the investigation included an electrocardiogram, blood nonprotein nitrogen, phenolsulphonephthalein excretion, erythrocyte and leucocyte counts, hemoglobin determination, and a differential count of the leucocytes.

During the course of treatment all patients were seen at regular intervals. Their blood pressure was taken by the same examiner (E. W. C.) under similar conditions such as time of day and relation to meals. They were carefully questioned for any symptoms suggesting toxic reactions. The blood sulfocyanate was determined under the direction of one of us (H. N. A.) either in the private laboratory or in the laboratory of Christian Welfare Hospital. All of the determinations are now being made in the latter institution by the regular technicians. The frequency of observation at the onset of treatment was one to two weeks but the interval was increased as the sulfocyanate level became stabilized. Several patients who have been taking sulfocyanate for many months are now being observed at monthly intervals.

At the onset of treatment the patient was given a prescription containing six grams of potassium sulfocyanate in 240cc. of 25 percent aromatic elixir and instructed to take one teaspoonful three times daily. The druggist was always contacted since we had some difficulty during the early months of treatment in securing the proper compounding of the prescription. In order to obtain a satisfactory blood sulfocyanate level it was usually necessary to increase the dose and in many instances the amount of the potassium sulfocyanate in the above mixture was doubled. The dose of the potassium sulfocyanate was varied according to the value of blood sulfocyanate which we attempted to maintain between seven and 10 milligrams percent. In the previous reports of others it had been the consensus of opinion that this was an effective and safe level. Recently we have used the tablets of sulfocyanate in a few cases with satisfactory results but the cost is greater to the patient.

Results — Tables I and II summarize the results in the 19 patients given potassium sulfocyanate. The group included 12 males and seven females and their ages varied from 29 to 62. Table I includes 14 patients with no demonstrable renal insufficiency while Table II includes the remaining five who had severe renal damage. The two groups have been separated because the latter type of patient would not be expected to show clinical improvement under any type of therapy but were merely included in the investigation to determine the possible toxic and therapeutic results that might be observed in all classes of patients.

The result was considered excellent when the systolic pressure fell to 170mm. or below with a corresponding fall in diastolic pressure and the patient felt symptomatically improved. The result was considered good when the blood pressure decreased but not as great as indicated above and if symptomatic improvement also occurred. Results were considered poor if no fall in blood pressure occurred, if there was no symptomatic improvement, or if toxic effects forced discontinuing the treatment.

In the entire group studied the results were excellent in 10 cases, good in two and poor in seven. Five of the cases which are considered among the poor results are those having severe

TABLE 1
Patients With Normal Renal Function

Case	Age	Sex	Blood Pressure Before S C N	Blood Pressure With S C N	Average Fall in Blood Pressure With S C N Syst.	Diast.	Average Blood S C N Mgms. Percent	Symptomatic Results
1	47	F	220/120	140/90	80	30	6.1	Improved
2	53	F	200/120	162/100	38	20	6.0	Improved
3	57	F	220/120	170/90	50	30	7.2	Improved
4	41	M	200/130	164/110	36	20	8.0	Improved
5	29	M	210/128	170/110	40	18	9.6	Improved
6	46	F	230/120	170/110	60	10	6.4	Improved
7	42	M	210/142	190/110	20	22	6.4	Improved
8	53	M	230/140	170/110	50	30	6.6	Improved
9	49	M	204/140	170/120	34	20	6.9	Improved
10	50	M	220/140	180/120	40	20	10.0	Improved
11	60	M	210/120	160/94	50	26	9.5	Improved
12	52	F	230/130	164/96	56	34	11.2	Improved
13	44	F	260/130	180/110	80	20	10	Dermatitis
14	57	M	250/140	200/110	50	30	10.7	Dermatitis

TABLE II
Patients With Renal Insufficiency

Case	Age	Sex	Blood Pressure Before S C N	Blood Pressure With S C N	Average Fall in Blood Pressure With S C N Syst.	Diast.	Average Blood S C N Mgms. Percent	Symptomatic Results
15	52	M	230/130	230/130	0	0	7.1	Increased weakness
16	45	M	230/170	230/120	0	50	9.3	Increased fatigue
17	62	M	280/130	210/110	70	20	16.0	Increased fatigue
18	29	F	200/120	170/110	30	10	10.3	Increased fatigue
19	49	M	210/130	170/110	40	20	10.7	No change

renal damage (Table II). Although three of this group showed a significant fall in blood pressure the patients were not symptomatically improved and the course of their disease was not altered. No serious toxic effects occurred among them but the potassium sulfocyanate was discontinued as soon as it was determined that no improvement would occur. Since the early months of the investigation no patients with severe renal damage have been treated with potassium sulfocyanate. All five of the patients included in Table II have died, the cause of death being uremia in three and cerebral hemorrhage in two. Their deaths could not be attributed to the sulfocyanate since the drug had been discontinued many months before their terminal illness.

In the remaining fourteen cases (Table I) the results were considered poor in only two. In both of these (cases 13 and 14) there was a satisfactory fall in pressure but the drug had to be discontinued because of generalized skin eruption which recurred when an attempt was made to resume treatment. Later studies demonstrated that case 14 had a functionless right kidney due to an atrophic pyelonephritis but the function of the left kidney was normal. A nephrectomy was performed but sufficient time has not elapsed to determine the results. Case 13 (Chart 1) had an excellent response in blood pressure and felt symptomatically improved until the severe skin eruption forced discontinuing treatment. This patient also had frequent attacks of angina pectoris preceding treatment with potassium sulfocyanate. The frequency

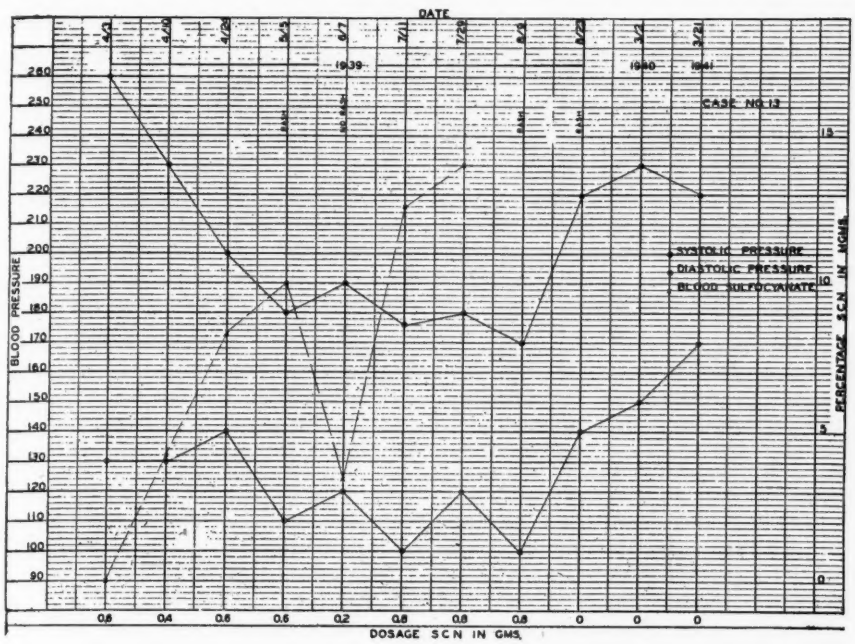


Chart 1

of the anginal attacks was not changed during the course of potassium sulfocyanate and have persisted since treatment was discontinued. Chart 1 indicates the return to the previous high level of her blood pressure after the conclusion of sulfocyanate therapy.

The average fall in blood pressure in the group of improved cases was 46mm. systolic and 22mm. diastolic. The maximum fall was 80mm. systolic and 30mm. diastolic. Chart 2 (Case 1) indicates the results observed in a patient who had failed to respond to other forms of treatment during a three year period. Her systolic pressure was 220mm. systolic and 120mm. diastolic when potassium sulfocyanate treatment was instituted in July, 1939. Her most recent blood pressure readings were 140mm. systolic and 90mm. diastolic with a blood sulfocyanate value of 6.1 mgms. percent. On one occasion her systolic pressure was as low as 110mm. and diastolic 80mm. with a blood sulfocyanate value of 13.3 mgms. percent. She felt well at that time but the dose of the sulfocyanate was decreased as it was not thought advisable to maintain such a high sulfocyanate blood level.

Chart 3 (Case 2) indicates the blood pressure results in another patient. It demonstrates the return to the previous high level when the drug was discontinued, and another satisfactory fall in pressure when therapy was resumed. On one occasion this patient's blood sulfocyanate level reached 20 mgms. percent but her only complaint was weakness. On a sulfocyanate blood level varying between six and 10 mgms. percent she feels well and states that she is less nervous, sleeps better and has fewer headaches than on previous forms of treatment.

Chart 4 (Case 3) also indicates satisfactory results in another patient with marked symptomatic improvement while maintaining a sulfocyanate blood level of five to 12 mgms. percent. This patient is interesting because of the small amount of potassium sulfocyanate necessary to maintain such a blood level. On one occasion a blood level of 24.4 mgms. percent was found with a daily dose of 0.4 grams and she complained of dryness of the mouth, tinnitus, weakness and an erythematous eruption of the arms. Potassium sulfocyanate was discontinued and

Chart 2

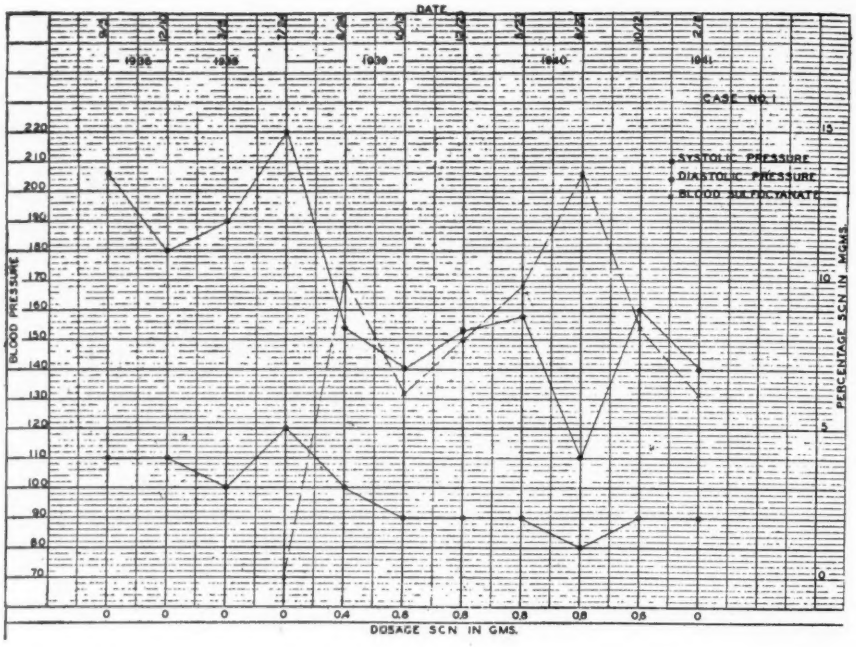


Chart 3

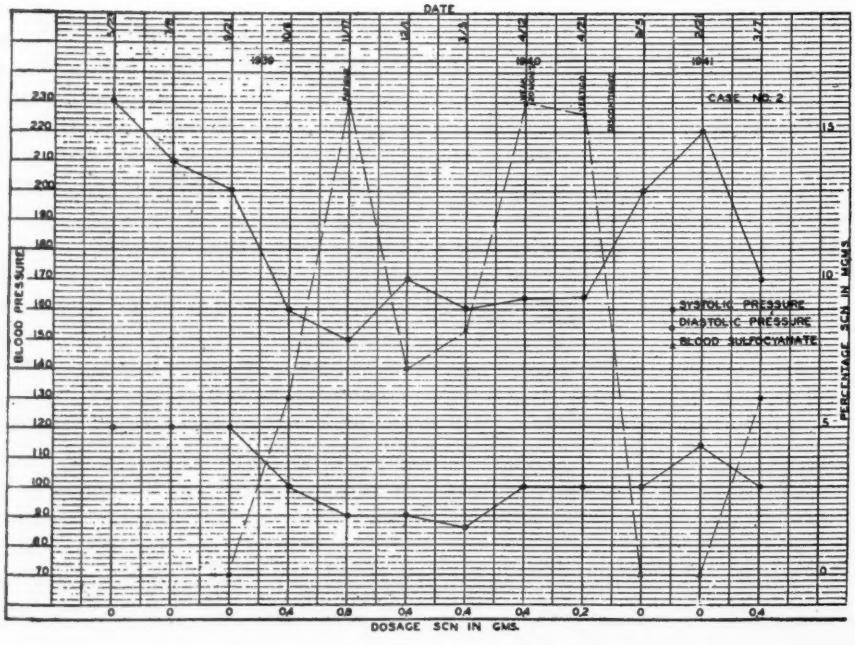
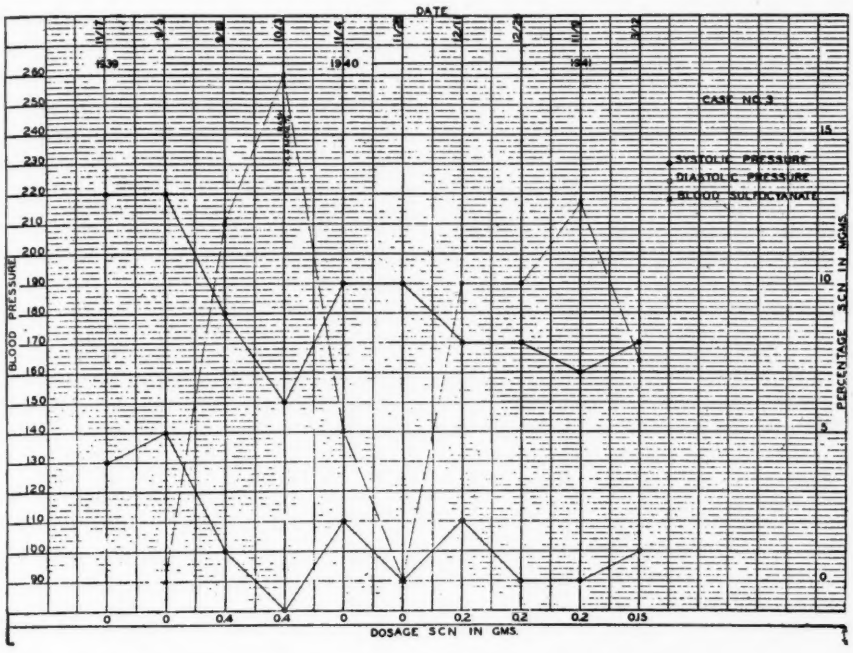


Chart 4



all symptoms disappeared. Later smaller doses were given (0.15-0.2 gm. daily) which have been well tolerated without toxic symptoms. This patient indicates the extreme caution that must be taken with individualization of dosage and frequent blood sulfocyanate determinations.

The amount of potassium sulfocyanate necessary to maintain a satisfactory blood sulfocyanate level has varied in individual patients. As indicated in Chart 4 (Case 3) only 0.15 grams daily has maintained a blood level of seven to 10 mgms. percent while 0.4 grams daily produced an alarming blood level of 24.4 mgms. percent. The maximum daily dose necessary to maintain a satisfactory blood level was 1.0 grams.

Symptomatic improvement has usually accompanied a fall in blood pressure. This has included a decrease in severity and frequency of headaches, less nervousness and irritableness, less insomnia, and less vertigo.

No serious toxic effects occurred except in the two cases with severe dermatitis and this disappeared after discontinuing potassium sulfocyanate. One patient developed a minor skin eruption which disappeared after reducing the amount of the drug and has not reappeared. A small area of furunculosis also appeared in another patient. Soon after the onset of treatment the majority complained of increased lassitude but this usually disappeared within several weeks. Fatigue and weakness accompanied extremely high blood sulfocyanate levels (20 and 24.4 mgms. percent) in two patients but were not present at satisfactory blood levels. One patient also complained of a moderate degree of aching in the calves of both legs but the severity was not great enough to discontinue treatment. One patient developed slight albuminuria and edema of the lower eye lids which disappeared after discontinuing treatment.

The results compare favorably with those reported by Barker[1], Massie, Etheridge and O'Hare[2], Griffith and Lindauter[3], Robinson and O'Hare[4], Bynum[5] and Covey[6]. We believe that

our results indicate that potassium sulfocyanate may be used safely and effectively in private practice in selected cases of hypertension providing the blood sulfocyanate level is controlled. This determination is not difficult or expensive to perform. A colorimeter is required but this is available in most hospital laboratories. As a result this form of treatment should be suitable to the physician who has accessible the facilities of the average hospital or private laboratory.

The use of sulfocyanate is not without danger and as such is not the perfect form of treatment for hypertension. However, no other drug has produced comparable results and the effect of surgical forms of treatment is still questionable. Hamburger[7] recently stated that the "cyanates have no place in the treatment of hypertension with or without blood levels" but we do not agree that this statement is justifiable. We have been unable to find a single death actually proven to be due to sulfocyanate when the treatment was properly controlled by blood sulfocyanate determinations and used in a case which might be expected to respond to such treatment. Hamburger reported the case of a seventy-one year old man whose death he thought might have been due to sulfocyanate administration. No blood sulfocyanate determinations had been made. He also cited the case of Garvin[8] who had reported the death of a seventy-one year old negro dying after the administration of sulfocyanate. Blood sulfocyanate determinations had been made in Garvin's case but the dose was increased after a blood level of 10 mgms. percent had been reached without satisfactory fall in blood pressure. We believe that the drug should be discontinued after no improvement has occurred with a satisfactory blood sulfocyanate level and should not be used in patients over sixty years of age. No other form of therapy has proved successful in elderly patients.

We agree with the observations of others that the drug should never be used unless frequent blood sulfocyanate determinations are made and that it should only be given to properly selected cases. Such a case should be an individual under sixty years of age with severe hypertension or with symptoms due to high blood pressure and without demonstrable renal or cardiac insufficiency.

SUMMARY

Potassium sulfocyanate was administered to a group of private patients having severe hypertension. Every case was observed during a control period before the drug was administered. Frequent blood sulfocyanate determinations were made. The results indicate that the drug may be used safely and effectively in office practice providing blood sulfocyanate levels are used as a control.

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DISCUSSION

DR. S. K. Robinson, Chicago: I was pleased to hear the paper by Dr. Cannady. It is a very well controlled series and he also cited the opposing views by Dr. Hamburger.

The question I want to raise is the degree to which it is advisable to reduce the blood pressure in hypertensive patients. It is an extremely important question and has never yet had an answer, but there are several indications on the horizon that in many instances at least reduction of the blood pressure in hypertensives may be a dangerous thing to undertake.

I have treated approximately 40 cases with cyanates and I agree it is a very effective therapeutic agent for the reduction of the blood pressure and many patients are symptomatically improved. On the other hand, I have had a case of temporary blindness result.

Now the question arises whether the elevation of the blood pressure in the individual is not a compensatory mechanism by which the organism tries to maintain proper oxygenation to certain tissues and whether reduction of blood pressure may not result unfavorably.

There are several reasons for this, but lack of time limits a discussion of all these, but fall in blood pressure may give rise to new symptoms and a rapid fall in blood pressure in hypertensives often precedes death. At the present time I am doing clinical work which substantiates the view that rapid variations in blood pressures, even at reduced levels, may be harmful. A wide pulse pressure may be more ominous than a high systolic blood pressure.

Now at the same time it is known that many patients are able to maintain a high systolic blood pressure, over 200 mm. for many years without enlargement of the heart. The question of adaptability arises here. There is clinical proof for the view that if the hypertension comes on gradually, the organism will adapt itself and carry on for many years. In such cases, a certain stability has resulted and the use of a vaso-dilator such as cyanate which acts only temporarily may be doing only harm because it breaks a stable system and substitutes a fluctuating one.

DR. W. O. Thompson, Chicago: I should like to ask Dr. Cannady whether he considers a reduction in blood pressure from 200 to 170 mm. of mercury as being proof that a real change has occurred.

I should also like to repeat Dr. Robinson's question. What really is the value of reducing the blood pressure in a patient with essential hypertension? Furthermore, will Dr. Cannady please tell us whether or not he himself would take potassium sulfocyanate if he had hypertension?

Dr. Edward W. Cannady, East St. Louis (Closing the discussion): I feel that the question as to the advisability of reducing blood pressure in hypertension is still an open one. It always arises when hypertension is discussed. Most observers believe that the severe hypertensive patient is in less danger if his pressure is reduced. However, the question is far from being settled, and I am not in a position to answer it.

The next question concerns the relationship of fall in blood pressure to improvement. It does not always mean improvement as we have demonstrated in our cases with renal insufficiency. We did not consider the result satisfactory unless clinical and symptomatic improvement accompanied the fall in blood pressure.

Doctor Thompson asked whether a fall from 200 to 170 is a real change. There was a more marked change in most of our cases showing good results. A fall from 200 mm. to 170 mm. systolic is not a great change but all of these patients had been studied on other forms of treatment for three to 36 months and had failed to respond.

It has been proven that there is a big personal equation in response to treatment of hypertension. It was shown not so many years ago that even the administration of hydrochloric acid was followed by a fall in blood pressure in some cases. Realizing this we did not give sulfocyanate unless the patient had received other forms of therapy during the control period.

Most of our patients did maintain some degree of hypertension. However, there was a substantial fall in the blood pressure in most of them and we believe that they are in less danger of a critical accident.

I would like to repeat that sulfocyanate is not the ideal method of treatment of hypertension, but we do believe the results obtained with it have been better than with any other form of therapy up to the present time.

Doctor Thompson asked whether or not I would want to take sulfocyanate if I had hypertension. As a member of a family of severe hypertensives I think that I would unless a better form of therapy appears, which I sincerely hope for.

DIMENFORMON BENZOATE* IN THE TREATMENT OF OVARIAN DEFICIENCY

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RIVER FOREST

At the present time there is available to the profession a diverse and rather complex assortment of estrogenic preparations. To the physician who finds endocrinology a new and relatively involved subject this situation is indeed a bewildering one, for it is often quite impossible for him to obtain any impartial account of the relative merits of each preparation, and many times he is guided solely by the commercial literature. It is the purpose of this report to classify the various estrogens and at the same time to present the results the author has obtained in a series of 15 cases of ovarian deficiency, using the estrogenic preparation, Dimenformon Benzoate (alpha estradiol benzoate).

Pure estrogenic substance was first isolated from ovarian extracts and follicular fluid by Doisy[1] in 1923. In 1929, Doisy and his coworkers[2] and Butenandt[3] obtained the substance in crystalline form. They termed the compound "theelin," but this name was subsequently discarded in favor of "estrone."

Shortly after the extraction of estrone, Butenandt and Marrian[4] announced the isolation of a similar substance, which differed from estrone

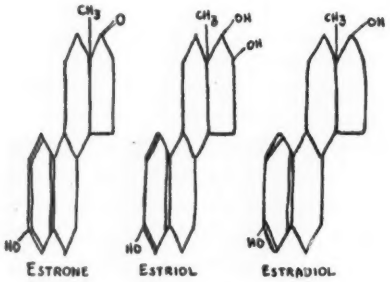
*Manufactured by Roche-Organon, Inc., Nutley, N. J.

chemically in the addition of one molecule of water. This substance was originally given the name "theelol," and later "estriol."

Subsequently, Schwenk and Hildebrandt[5] prepared another estrogenic substance, closely related to estrone and estriol. This compound was termed estradiol, and it was synthesized in the laboratory from estrone, before it was found in the natural state. In 1935 MacCorquodale, Thayer and Doisy[6] in a preliminary report announced the isolation of estradiol from sow's ovaries, and in 1936 they furnished convincing proof of the identity of this substance with synthetically-derived estradiol.

According to current concepts estradiol is believed to be the pure estrogenic hormone, although no convincing evidence for the validity of this thought insofar as humans are concerned has been offered. Estrone and estriol are considered break-down or excretory forms of the pure hormone.

The chemical relationships between estrone, estriol, and estradiol are illustrated below. They are all closely allied to the sterols (cholesterol, etc.), and possess the so-called 4-membered cyclopentano-phenanthrene nucleus characteristic of these hydrocarbons:



Estrone, estriol, and estradiol are used in various chemical forms, therapeutically, and their physiologic activities possess certain quantitative differences. Estrone is effective by injection, but is not appreciably active orally. Its action, parenterally, is rather pronounced but of comparatively short duration. Estriol, on the other hand, is effective orally, and its therapeutic action is quite marked. Estradiol is the most potent estrogenic substance of the three, but orally is not as effective as estriol.

Numerous studies of the comparative activity of these substances and their derivatives have been reported recently. Sondern and Sealey,[7] observing the effects of various orally administered estrogens on rats and mice, concluded that estriol was twice as effective (orally) as estradiol, and almost three times as active as estrone. Munro and Kosin,[8] administering estrone, estradiol, and two estradiol esters to baby chicks, observed, "This study on baby chicks, corroborates the results previously secured by other workers in mammals with respect to the relative potency of 4 estrogens. In their ascending order these are: estrone, estradiol, estradiol benzoate and estradiol dipropionate. Estradiol is only slightly more potent in chicks than is estrone, whereas in mammals the former is much more active."

In his recent textbook, Hamblen[9] discusses the relative activity of various estrogens administered in different ways. He states, "Estrogens are active by the following routes of administration; subcutaneous, intravenous, oral, vaginal and nasal and by inunction. Effectiveness of these principles, when given subcutaneously is enhanced by the employment of multiple frequent doses and the use of oil as a solvent for the purpose of slowing up absorption. The more prolonged activity of certain esters, such as estrone benzoate and estradiol benzoate, is related probably to delayed absorption. . . . The relative inefficiency of estrogens by mouth is probably due to poor absorption from the intestinal mucosa, since there is no evidence they are destroyed by digestive enzymes."

Greene[10] discussing endocrine therapy for gynecologic disorders concludes that estradiol benzoate is the most suitable estrogen for all around usage. He states that it has the following advantages over estrone or estrone-like preparations: (1) It is more potent; (2) it is more efficient; (3) it actually costs less if judged on an activity basis.

Sevringhaus[11] in a rather comprehensive report discussing the merits of various estrogens points out that direct therapeutic comparisons are quite difficult because of the diverse nature of the preparations in use and the difficulty in comparing the units employed by different manufacturers. He remarks, "Some preparations are

marketed in terms of international units, others of rat units, others of 'active biologic units' and 'day oral units' and others of milligrams. The weight basis is obviously the best, but it cannot be applied to mixtures of more than one estrogen. This interferes at once with the evaluation of the oldest standardized preparation on the market, which contains several estrogenic substances but chiefly estrone. Furthermore, the weight basis is misleading when applied to estradiol, for in animal assays this is known to be far more active than estrone or estriol. But the comparisons of biologic activity vary significantly, depending on the test which is employed. There is no accepted ratio for comparison of the efficacy of these pure estrogenic molecules in relieving the symptoms of women."

Inasmuch as there is some confusion concerning the actual values of different units in use, the following facts should be kept in mind:

1. An international unit is the specific estrus-producing activity contained in 0.1 gamma (one ten-thousandth of a milligram) of the international standard estrone.

2. A rat unit is the estrus-producing activity, as measured by vaginal smears (Allen-Doisy method), of the smallest quantity of estrogenic substance which produces estrus in 75% of sensitized spayed adult rats when administered in 3 divided doses at 4-hour intervals.

3. An international benzoate unit is the specific estrus-producing activity contained in 0.1 gamma (one ten-thousandth of a milligram) of the international standard estradiol benzoate. This unit applies to benzoylated estrogens and although the international unit and international benzoate unit refer to the identical weights of estrogenic substances, they do not imply the same degree of estrogenic activity.

It is obviously impossible to compare substances which are prepared on a pure weight basis with those which are prepared according to standards of biological activity. Doisy[12] advocates that estrogens be defined in terms of exact weights and suggests that biological units be abandoned. He states, "In my opinion it is not feasible to assay against a standard any estrogen other than the estrogen of which the standard is composed. . . . To illustrate the discrepancies of assay when another estrogen is assayed against the estrone standard, estriol has been compared with estrone, mice being used for the assay. If each substance is given in a single injection of oil, the estrone is two hundred and sixty-six times as potent as estriol. If each is given in aqueous solution in four equal portions at intervals of twelve hours, the estrone is four times as potent as estriol. Depending on the solvent and on the division of the dose, estrone may be four or two hundred and sixty-six times as potent as estriol. A similar situation exists with respect to the relation existing between estrone and a-estradiol. When each is given in aqueous solution in three portions during a nine hour period, the a-estradiol is ten time as active as estrone if rats are used for the assay but only twice as potent if mice are used."

From the foregoing it is evident that unqualified comparisons of estrogenic substances cannot be made. However, experimental evidence indicates that one rat unit of estradiol benzoate is from five to ten times as active clinically as one international unit of estrone. Clinically, estradiol benzoate possesses a more prolonged and more pronounced activity than estrone.

Geist and Salmon,[13] for example, point out these relationships as follows: "1 Gm. of estrone yields 1,000,000 R.U.; 1 Gm. of estradiol, approximately 12,000,000 R.U.; 1 Gm. of estradiol-benzoate, approximately 6,000,000 R.U. It has been estimated that 1 rat unit is equivalent to approximately 5 international units."

Before referring to the clinical results obtained in the present series of cases of ovarian dysfunction, mention should be made of another estrogenic substance which has recently been synthesized — stilbestrol. Stilbestrol and its derivatives are synthetic chemicals which do not contain the phenanthrene ring nucleus common to natural occurring estrogens.

The following cases of ovarian deficiency were treated with Dimenformon Benzoate by intramuscular administration. In each instance injection was given with a 23 gauge, 1 to 1½ inch needle, deep in the upper gluteal region. One-

half cc of air was routinely injected following the estrogen, to insure the substance staying in muscle tissue. Utilizing the preparation in this manner there was no technical difficulty in administration, and the patient experienced only a transient sensation of burning or stinging which promptly disappeared when the needle was withdrawn.

CASE REPORTS

Case 1 — Mrs. M. B., age 48. First visited my office on November 9, 1939 complaining of headaches, fatigue, depression, frequent hot flashes, and insomnia for a period of six months. Symptoms have become gradually worse. Menstrual history: 13x28x3; moderate flow; regular until six months ago when periods became scanty, stopping about three months before first visit. Patient cried frequently during history-taking and examination.

Physical examination: Essentially negative. Vaginal examination reveals a multiparous vagina, normal cervix, and normal anteverted uterus. Vaginal secretion thick and yellow, with foul odor.

Diagnosis: Menopause, with involutional melancholia.

Treatment: Injections of 0.166 mg (1000 R.U.) Dimenformon Benzoate were given twice weekly for two months with excellent result. By the middle of January, the mental condition had completely cleared, there was no vaginal discharge, and the patient was symptom-free.

Case 2 — Mrs. J. A. An old patient suffering from menopausal disturbances since 1937 and carried along on thyro-ovarian tablets. Returned December 2, 1939 complaining of headaches, extreme nervousness, and hot flashes of more intense nature for past two months. Menstrual history: 13x28x4; para V.

Physical examination: Essentially negative. Vaginal examination reveals a multiparous vagina, small cervical tear, and moderate discharge.

Diagnosis: Menopause.

Treatment: Patient was given 0.083 mg (500 R.U.) Dimenformon Benzoate twice weekly for one month with marked improvement. Further treatment with injections of 0.166 mg (1000 R.U.) Dimenformon Benzoate every 4 to 5 weeks kept the patient symptom-free.

Case 3 — Mrs. L. B., age 32. Consulted me September 12, 1940 complaining of extreme nervousness, choking feeling in the neck, loss of weight, and pains in stomach. She had these symptoms more or less constantly since 1933 when her first child was born. She had been under treatment for enlargement of the thyroid and what she termed "hyperthyroidism" for the past 2½ years; took 2 grains of thyroid daily until six months previous. In November, 1939, a B.M.R. was —1. Menstrual history: Cycles were irregular, varying from 28 to 36 days, with occasional missed periods before marriage. After childbirth, periods became regular in character but were scanty, and the flow was brownish and lasted for three days.

Physical examination: Essentially negative. No thyroid enlargement detected. Vaginal examination was also negative.

Treatment: A phenobarbital and bromide mixture was prescribed along with vitamin B complex. She returned in 10 days, feeling somewhat improved, but still complaining of marked choking sensations. On September 30 B.M.R. was —3, blood and urine were normal, and X-ray indicated no pressure on the trachea. She was then sent to a thyroid specialist and was reported as having no thyroid enlargement nor any evidence of hyperthyroidism.

On September 12, 1940 it was decided that estrogenic therapy be instituted on basis of diagnosis of preclimacteric hypo-ovarian function.

An injection of 0.083 mg (500 R.U.) Dimenformon Benzoate was given on September 12 and 0.166 mg (1000 R.U.) on September 22. On September 25 patient stated she felt markedly improved and that the choking sensations were absent. She received, at 3 day intervals, 0.166 mg (1000 R.U.) until November 9 when injections were reduced to 7-day intervals.

The patient states that for the first time in seven years she is able to sleep through the night and do her own housework without fatiguing. The only time that symptoms return is during the menses, and then they are relatively mild.

Case 4 — Mrs. L. B., age 45. A regular patient since 1928; came to me on May 1, 1939 complaining of severe menstrual bleeding for past two months. She also complained of fatigue, and difficulty in sleeping.

Physical examination: Essentially negative. Vaginal examination revealed profuse bleeding from the uterus. No tumor masses were present. The uterus was anteverted.

Diagnosis: Possible endometrial hyperplasia.

Treatment: Fluid extracts of ergot and hyoscyamus were given and the patient put to bed. Bleeding stopped in several days and on May 22, 1939, a diagnostic dilatation and curretage was done. Laboratory reports on tissue showed no evidence of malignancy — but a hyperplasia of endometrium. Blood count at that time showed a moderate secondary anemia. Liver extract was given by intramuscular injection three times weekly, and by August 12, 1939 the hemoglobin was 90%.

On December 26, 1939 patient returned complaining of bleeding again. It was decided to institute deep

X-ray therapy. Bleeding subsided after a week and treatments were continued until January 13, 1940. At the end of January she began to complain of hot flashes, weakness when in crowds, and extreme nervousness. Small doses of estrogenic hormones were given with moderate effect until March 9, 1940. On March 16, 1940, 0.083 mg (500 R.U.) Dimenformon Benzoate was given, and 0.166 mg (1000 R.U.) repeated March 19, 1940. The symptoms were markedly reduced, and 0.166 mg was administered weekly for 4 weeks with complete subsidence of symptoms. Then injections were given at intervals of 2 weeks and finally therapy was reduced to 0.083 mg every six to eight weeks. On December 14, 1940, patient states that she has had no return of bleeding or symptoms.

Case 5 — Mrs. M. G., age 49. First visited my office on September 10, 1939 complaining of persistent vaginal bleeding of six months duration.

Physical examination: Essentially negative. Vaginal examination revealed a multiparous vagina, no cervical tears, but blood flowing from cervical canal. Uterus was firm and slightly enlarged but not nodular.

Diagnosis: Probable endometrial hyperplasia.

Treatment: Patient was sent to roentgenologist for deep X-ray therapy. On November 13, 1939, she returned complaining of dizziness, headaches, and hot flashes. The latter were more or less continuous during the day and night, and were followed by profuse sweating. The vaginal bleeding had completely stopped.

The patient was given 0.166 mg (1000 R.U.) Dimenformon Benzoate three times a week for 2 weeks with marked diminution of symptoms. Treatment was continued until May 18, 1940, and by then the symptoms had completely subsided. Patient now returns every six to eight weeks for an injection. There has been no return of symptomatology.

Case 6 — Mrs. J. B., age 46. Came to me on September 30, 1938 complaining of scanty periods for past six months. No other complaints were made.

Physical examination: Essentially negative except for some tenderness on deep palpation in right lower quadrant. Vaginal examination revealed multiparous vagina, normal cervix, and an infantile and anteverted uterus.

Diagnosis: Probable early menopause.

Treatment: Patient was placed on Menformon Tablets three times a day. The subsequent periods in October, November, and December 1938 were normal. On January 7, 1939, patient was operated upon for an acute pre-gangrenous appendicitis. At this time the ovaries were examined and showed evidence of atrophy. The uterus was small and anteverted. The patient made an uneventful recovery and was not seen from January 18, 1939 until February 13. She returned on this day stating that she had not menstruated in January or February and had been exposed to conception one week before entering hospital for surgery. An Aschheim-Zondek test was done and proved negative. On March 9, she returned complaining of nervousness, profuse perspiration, and mental depression. She stated that she was often awakened at night by a feeling of intense warmth and profuse sweating about head and neck.

The patient was given 0.083 mg (500 R.U.) Dimenformon Benzoate twice weekly until March 28, when the dosage was reduced to once weekly until April 20. She now returns about once every four to six weeks for an injection. She states that she feels well and offers no symptomatic complaints.

Case 7 — On September 16, 1939, I was called to see Miss M. D., age 21, who was in bed complaining of a great deal of abdominal pain, extreme nausea, and vomiting of bile-stained material. A relative informed me that she was due to menstruate the next day and that this was a regular monthly occurence since 1934. She had been told that this would subside following marriage and pregnancy.

Physical examination: Essentially negative. Vaginal examination revealed an infantile uterus.

Diagnosis: Dysmenorrhea and infantilism.

Treatment: A ¼ grain of m.s. with 1/150 gr. atropine sulfate was administered and repeated in 6 hours to relieve the symptomatology.

On September 23, 1939, estrogenic therapy was instituted, and 1000 I.U. injections were given every four days until October 9. The menstrual flow started on October 13 with moderate pain but persistent nausea and vomiting that necessitated m.s. gr. ¼ and atropine 1/150 once. The same process was then repeated with 2000 I.U. estrogenic substance from October 17 to November 7. On November 10, menstruation started, and pain was present for 1 hour, but nausea and vomiting lasted for 12 hours. The next month, 3000 I.U. injections of estrogenic substance were used and menses began on December 12. No appreciable improvement in symptoms was noted.

This procedure was continued until May, 1940 when a dosage of 10,000 I.U. estrogenic substance was reached. The patient's weight had increased 8 lbs. and she seemed in better condition, but the nausea and vomiting at the time of menstruation persisted for 12 to 18 hours during first 24 hours of the period.

On May 24, 1940, 0.166 mg (1000 R.U.) Dimenformon Benzoate was given and repeated once a week. During the next period, in June, there was no pain, and nausea lasted for only about 6 hours.

Injections of 0.166 mg were continued weekly until October, 1940. The patient at no time was confined to bed during the first 24 hours of the period. No dysmenorrhea was noted and only slight nausea. The flow has been moderate, usually lasting 3 days. Weight increase has been progressive. The patient has obtained secretarial work and has on no occasion been absent from work because of menstrual disturbances.

Case 8 — Miss E. L., age 55. Came to me January 15, 1938 complaining of pain in the precordial region, extreme nervousness, insomnia, and hot flashes, more or less constantly for a period of 2 years. Menses were regular until 2 years previous.

Physical examination: Essentially negative. Vaginal examination, negative. X-ray of chest revealed nothing of significance.

Diagnosis: Menopause.

Treatment: Liver extract and iron were given orally. Ovarian extract gr. xxxi three times a week were administered hypodermically and symptoms were partially relieved but there were still complaints of insomnia and flashes after six weeks.

Estrogenic substance was used with a further diminution of symptoms but never to the extent where the patient was completely free for even a day. A record kept by the patient showed an average of 5-6 hot flashes a day, most of them being moderately severe. When dosage of 10,000 I.U. per injection was reached, the patient felt a great deal better, but she still complained of flashes. On March 9, 1940, 0.166 mg (1000 R.U.) Dimenformon Benzoate was given without the patient knowing the medication had been changed. She reported five days later that the number of flashes was markedly reduced, to about half. Since then, she has received one injection of 0.166 mg weekly until the present time. The number of flashes average 4 to 5 weekly — as many as 72 hours elapsing without the patient feeling any disturbances — and those she does have are exceptionally mild.

This patient has probably received more estrogenic substance than is needed in the average case. Although she previously received many forms of estrogenic substance, both natural and synthetic, I believe that the estradiol benzoate has been more efficient in making this patient's life more pleasant.

Case 9 — Mrs. A. L., age 46. First came to my office on January 29, 1940, complaining of frequent sensations of fullness and warmth in the head that gradually became more intense since a hysterectomy in 1933. At times, she had spells of dizziness, and during the previous six months, she had been having attacks of weeping, for no apparent cause. She is happily married.

Physical examination: Essentially negative. Vaginal examination revealed a small uterus and small atrophic cervix.

Diagnosis: Menopause and mild involutional melancholia.

Treatment: This patient was given graduated doses of natural estrogenic substance from 3000 to 10,000 I.U. at 3 to 5 day intervals until March 4, 1940 with slight effect on her symptoms. Starting March 9, 0.166 mg (1000 R.U.) Dimenformon Benzoate was given at 5 day intervals, and there was complete subsidence of all symptoms by April 20. The interval was lengthened to 10 to 14 days by June 1. At present the patient comes in at 6 week intervals for an injection and is in good health with only an occasional flash but no return of mental depression.

Case 10 — On July 15, 1940, Miss A. M., age 34, visited my office complaining of pain in the right lower quadrant on defecation. The pain had gradually become worse over a period of 3 months. At times there was obstipation.

Physical examination: Abdominal palpation, revealed a mass in right lower quadrant, approximately 18 cm in diameter. Vaginal examination confirmed findings of a tumor mass but no difference could be made between ovarian cyst and uterine fibroid.

Diagnosis: Pelvic tumor mass.

Treatment: The patient was operated upon 3 days later and a uterine fibroid was found lying in right pelvic area. The uterus was studded with smaller fibroids. The left ovary was cystic and about 5 cm in diameter. The cyst was filled with chocolate-colored material. A supracervical hysterectomy and left oophorectomy was performed. The patient made an uneventful recovery and left the hospital in 14 days.

On October 25 the patient complained of faintness and profuse perspiration when in crowds. There were apparently no flashes. 0.083 mg (500 R.U.) Dimenformon Benzoate was given, and 0.166 mg (1000 R.U.) on October 29 and 31, with marked improvement by November 7. At that time the cervix was examined and found normal. Injections of 0.166 mg were given on November 15, 22, and 30, December 7 and 17. There was no recurrence of symptomatology.

Case 11 — Mrs. E. B., age 30. Came to my office on July 18, 1940 complaining of severe pain associated with menstruation, which lasted for 3 days of a seven day period. Cycle was 30-35 days. Menstruation was only scanty, but was accompanied by passage of large clots. This condition had existed for approximately six months, and was similar to symptomatology 3 years previous.

Physical examination: Essentially negative except for tenderness on deep palpation in both lower quadrants. Vaginal examination indicated that both ovaries were slightly larger than normal, and were tender to palpation. The uterus was anteverted and of normal size. The cervix was normal.

Diagnosis: Functional dysmenorrhea.

Treatment: It was decided to give estrogenic substance every 4 days during the middle of the menstrual cycle. Accordingly the patient received .033 mg (200 R.U.) Dimenformon Benzoate on July 18, .083 (500 R.U.) Dimenformon Benzoate on July 22, and .083

mg again on the 26th. The period in August was associated with much pain, and bleeding was quite profuse. In August, injections of .166 mg (1000 R.U.) Dimenformon Benzoate was given on the 20th, 26th, and 30th. In September, menses lasted four days, and there was pain only for a few hours during the first day. Clots were few in number. Another three injections of Dimenformon Benzoate were given in October, with occurrence, subsequently, of another comparatively symptom-less period.

Case 12 — Mrs. H. R., age 26. Came to my office on October 10, 1940 complaining of pain in the right lower quadrant and vaginal bleeding of one month's duration. Pain at the time of the last period was quite severe. Had childbirth February 25, 1939. Menstrual cycles were 28 days and regular.

Physical examination: Essentially negative. Vaginal examination revealed a retroverted uterus, and firm cervix with a clean, small healed scar. There was a brownish uterine discharge, tinged with blood. The right ovary was normal in size, but tender.

Diagnosis: Dysmenorrhea.

Treatment: Injections of 0.083 mg (500 R.U.) Dimenformon Benzoate were given on October 15, 22, 28, and 31.

Menses started November 2 and there was no dysmenorrhea. The flow was moderate, lasting 5 days. 0.083 mg Dimenformon Benzoate was given on November 7, 14, 22 and 29. Vaginal bleeding occurred for one day on November 16. Menses started November 30, lasted 5 days, and there were mild crampy pains on the first day. Bleeding was moderate. No medication was given in December. Bleeding occurred on one day, December 14. Menses started December 27, lasting 3 days and there were relatively mild crampy pains.

Case 13 — Mrs. L. R., age 25, was seen at home on November 10, 1940 complaining of extreme weakness, nervousness, frequent choking sensations in the neck, and numbness in the arms and legs. She stated that this condition had existed since childbirth, one year previous. Menses were normal, and the cycle was 28 days.

Physical examination: Patient appeared quite undernourished. The thyroid gland was slightly enlarged, symmetrical, and firm. Heart rate was rapid. Vaginal examination was essentially negative.

Diagnosis: This case gave evidence of hyperthyroidism but from previous experiences with preclimacteric ovarian dysfunction in young women, it was decided to use estrogenic therapy for a short while and observe the results.

Treatment: 0.083 mg (500 R.U.) Dimenformon Benzoate was administered on November 12, 1940, 0.166 mg (1000 R.U.) on November 15, and repeated on November 18. On this latter date, the patient stated she did not feel as nervous. The chocking sensations were lessened, and the feeling of numbness in the extremities (which she stated was really a feeling of coldness) was entirely gone. 0.166 mg injections were given twice weekly until December 17, when patient stated she felt much better. She was able to do her work without feeling exhausted, and was much less nervous. Injections of 0.166 mg were subsequently given on December 24 and December 31. By the latter date, there had been a gain of eight pounds, and a marked improvement both mentally and physically in the patient.

Case 14 — On March 18, 1940, Miss R. S., age 20, consulted me about her menstrual cycles and gave the following history: At the age of 16 she started to menstruate and did so on four monthly occasions. The flow was moderate and lasted 5 days. Then the periods completely stopped and in February, 1937, she sought treatment. Injections were given and she then menstruated at intervals of 35 to 73 days according to a record she kept. She stopped treatment in the spring of 1939 until she consulted me.

Physical examination: Essentially negative except for moderate obesity. Vaginal examination revelaed a red and tender mucosa, and foul smelling discharge. The uterus was infantile and anteverted. Laboratory examination of vaginal secretion indicated a trichomonas infection.

Diagnosis: Secondary amenorrhea; trichomonas vaginalis.

Treatment: Thyroid tablets, gr. I., were given once daily and silver picrate powder was applied for the trichomonas infection.

On April 9, the vaginal condition was markedly improved. Injections of 0.083 mg (500 R.U.) Dimenformon Benzoate were started and given every 4th day. The thyroid extract and silver picrate powder were continued. Her general condition improved steadily and by August there was a weight loss of 13 lbs. The vaginal condition cleared completely. Cervix was clean and uterus approximately normal in size. No menstruation occurred during this time.

On August 19, 1940, 0.333 mg (2000 R.U.) Dimenformon Benzoate was given, repeated on August 13 and 15. 0.166 mg (1000 R.U.) was given August 20. One unit of Progestin was given August 20 and 24. The patient started to menstruate August 27.

The same procedure was followed in September and normal menses followed on October 1. In October the procedure was the same except that only 0.166 mg was used instead of 0.333 mg. In November, a rest period was given but no menses followed. On December 9, 0.166 mg was given and 1 unit of Progestin on December 16. Normal menses followed on December 20, 1940.

I believe that the procedure used in December, 1940 will be sufficient to keep this patient menstruating if repeated monthly for a time. By giving Dimenformon Benzoate during the estrogenic phase of the cycle and Progestin during the progestational, it is hoped eventually to stimulate normal cyclic endocrine responses.

Case 15 — Mrs. G. S., in her early 30's, visited my office on September 3, 1940 complaining of fatigue, backache, nervousness, and scanty menstruation. Most of these symptoms had been present for 3 years, following her last pregnancy. The menstrual flow had been scanty, and during the last 2 periods had lasted only one day. The flow was brownish rather than bloody.

Physical examination: Essentially negative. Vaginal examination revealed a multiparous vagina, small ulcerated cervical tear, and weakened recto-vaginal wall. Sphincters were intact. X-ray of chest was negative. B.M.R. —4. Aschheim-Zondek (Friedman's modification) was negative.

Diagnosis: Possibly pre-climacteric ovarian dysfunction.

Treatment: On October 29, 0.083 mg Dimenformon Benzoate was given. On November 8, the patient stated she felt somewhat better, and 0.166 mg. was given on same day and repeated on November 11, 1940. From this latter date until December 9, I did not see patient because of illness of other members of the family, but on December 9 she stated she felt exceptionally well during the 1st week after the last injection, and that afterwards the feeling of discomfort started to return. 0.166 mg. Dimenformon Benzoate was given, and repeated on December 13 and 19, at which time the patient felt markedly improved.

DISCUSSION

In connection with the foregoing case presentations two particular points deserve emphasis. The first is the relatively frequent occurrence of menopausal-type cases in young women, with onset dating back to previous pregnancy. Apparently the incidence of cases of these types is higher than generally suspected. This may be accounted for, according to present theories, on the basis of alterations in the anterior pituitary gland during and after pregnancy. During pregnancy the gland is believed to be hyperactive, whereas after pregnancy there may be a period of marked depression of pituitary activity to the extent of almost complete lack of ovarian stimulation. Subsequently, it is conceivable that pituitary activity may increase without effectively influencing ovarian function. In any event, I believe that it is always wise to bear in mind that ovarian insufficiency may be responsible for many so-called nervous manifestations in comparatively young women.

The second point I wish to stress is the superiority of estradiol benzoate as a therapeutic agent in treating ovarian deficiency. Several of the above cases were given preliminary treatment with estrogenic preparations containing estrone, and the results were not completely satisfactory. Hot flashes, in particular, failed to respond adequately to estrone therapy. However, when estradiol benzoate was used, not only were much smaller doses required but symptoms were brought completely under control. This impression is not mine alone for I have noted it in several recent reports on menopausal therapy.

It should be pointed out that in the series of cases described above, doses of 0.166 mg (1000 R.U.) Dimenformon Benzoate twice weekly usually sufficed even in rather severe menopausal patients. It is my opinion that the comparatively massive doses utilized by some clinicians are usually unnecessary. Small doses often serve the purpose and eliminate much unnecessary expense to the patient.

SUMMARY

1. A brief discussion of the three major natural estrogens (estrone, estriol, estradiol) is given. Comparison is made of the relative potencies of these products and the different unit systems in current use.

2. A series of cases of ovarian deficiency is presented in which small doses of Dimenformon Benzoate (alpha-estradiol benzoate) provided highly satisfactory results.

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IMPERFORATE HYMEN

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ELGIN

J. C. Nott in 1843 reported two cases of vaginal atresia in infants. The hymen in each case was evident as a whitish sac between the labia and ruptured spontaneously. In 1891 Ross collected thirty-six cases from the literature. McGlinn and Harer state that the condition of hematometra is so rare that "many gynecologists of broad experience have never encountered a case." Calvin and Nichamin in 1936 reported fourteen cases from Chicago and stated there were twenty-eight in the literature from 1917 to that time. These authors state that the syndrome associated with imperforate hymen is fairly well known to the gynecologist, but rare to the pediatrician and general practitioner.

Anatomy—The hymen consists of two layers of stratified squamous epithelium between which is a thick layer of connective tissue. This connective tissue layer may be considerably thickened at times and very tough. This diaphragm may be so thick and rigid as to require surgical intervention before coitus can be carried out, or it may be very elastic. Cases have been reported where pregnancy has occurred in the presence of an intact hymen.

In the infant the hymen is redundant and extends outward between the labia. The introitus in the adult virgin varies from one to fifteen millimeters. This opening is usually closed by approximation of the edges. The shape of the opening varies. It may be circular, semilunar, crescentic, fimbriated, septate, denticulate, or cribiform. While reporting two cases Drosin stated that during intercourse hymens are usually torn in the center of the posterior segment.

Embryology—The vagina is formed by the fused distal ends of the Mullerian ducts which have united to form a solid cord. The cells in the center of this cord liquefy and form the vaginal canal. It has been generally considered in the past that the distal cells of the fused ducts did not liquefy, and thus a diaphragm was formed. The Mullerian ducts unite during the eighth week of intra-uterine life and the vagina has a lumen at the sixteenth week.

Cunningham thought that the hymen was formed from a fold at the distal end of the recently formed vagina at the junction with the urogenital sinus. He therefore concluded that the hymen was embryologically a portion of the vagina.

Hypersecretion of the uterus at birth is occasionally seen. Lazarus considered this a response on the part of the infant's uterus to some type of maternal hormone. In subsequent infantile life and until puberty, the uterus remains quiescent. Imperforate hymen is then a congenital defect or the result of an infantile inflammatory reaction. Complete atresia of the vagina may occur. Hematocolpometra cannot develop unless the uterus is sufficiently formed to perform the function of menstruation. Excessive proliferation and coalescence of the distal vaginal cavity in the vicinity of the hymen also may be the cause of the imperforate hymen rather than the failure to regress, according to Hammond.

Pathology—With the onset of menstruation the vaginal cavity is distended progressively and the condition is one of hematocolpos. With the increasing pressure of the retained material in the vagina, the uterus has to expel each addition with greater force. A resulting hypertrophy of the uterine musculature occurs accompanied by a thickening of the endometrium. A time then comes when the menstrual fluid cannot be expelled and pressure within the uterine cavity increases. With this increase there occurs, to a certain extent, a compensatory atrophy of the endometrium which lessens the progress of the distention. Eventually, however, the fluid is forced into the tubes, distending them and resulting in leakage into the peritoneal cavity. This causes a sterile peritonitis with dense adhesions in the pelvis and in some cases endometriosis. In this process the tubes become sealed and distention then continues until surgical relief is obtained or rupture occurs. Tubal rupture has been reported. A seven year old girl with an imperforate hymen and a vagina distended with pus was seen by Melodia.

Signs and Symptoms—The signs and symptoms of hematocolpometra are secondary to the

retention of menstrual flow. A frequent complaint is the absence of menses in girls from fourteen to twenty years of age.

There may be more or less severe abdominal pain occurring at monthly intervals without evidence of the menstrual flow. Along with this there is a gradual increase in the size of the abdomen and dysuria and constipation may become marked. Pelvic distress and discomfort become more severe as the products of menstruation progressively distend the vagina, uterus, and tubes. Ultimately it may enter the abdominal cavity and give evidence of peritoneal irritation. Malaise, weakness, weight loss and secondary anemia are frequently found.

Snodgrass called attention to acute urinary distention which is frequently the distress which causes the physician to be consulted. Generalized abdominal pain may be present and a fluctuating mass may be seen at the vaginal outlet. The case reported by Snodgrass revealed a mass in the vagina on rectal examination and the hymen intact, and fifteen hundred cubic centimeters of old blood was obtained on incising. A metal catheter was required to empty the bladder.

The abdomen may reveal a large irregular mass, as in the case reported by Kotz, filling the entire lower abdomen and pelvis and extending one finger above the umbilicus. The left cornu of the mass extended to the region of the left kidney. The most characteristic syndrome is that of periodic symptoms which usually accompany menstruation, the absence of menstrual bleeding, and the presence of a doughy fluctuating mass in the vagina. Anderson's patient, a fifteen year old girl, had an acute onset of distress simulating labor pains and was diagnosed as pregnant by several physicians. Musick and Wakeman report the case of a girl of sixteen who for two years had been receiving morphine hypodermically for the severe cramps and backache. The duration of the symptoms may be from one week to one year. Three cases from one family were reported by McIllroy. Nasiruddin reported the case of an eighteen year old girl in which he found a cyst-like tumor about the size of a small orange protruding outside the vulva. The urinary meatus was not visible.

A sausage-shaped or pear-shaped mass may be palpable to one side of the main mass and is indicative of tubal involvement. The mass may be called ovarian cyst, appendix, or various urinary abnormalities. Nelson reported the case of a thirteen year old girl who underwent a laparotomy because of symptoms suggesting acute appendicitis. No rectal nor vaginal examination was made. When what appeared to be a right ruptured tubal pregnancy was seen, the hymen was examined and found to be bulging

1. The appearance of the abdomen when recumbent and after catheterization.

2. The type of material obtained. A dark, viscid, tarry substance of which there were over 2500 c.c.

3. Appearance of the abdomen after evacuation of uterus and vagina.

and imperforate. About three quarts of tarry fluid escaped when the hymen was ruptured. Inspection of the external genitalia and rectal examinations will make the diagnosis early. The mass varies greatly in size, depending on the time of onset of menses in relation to the time of the complaint. The hymen will be seen to be pale bluish and tense. Monradran reported a case with the complaint of amenorrhea in which there was a history of attacks of pain in the right lower quadrant. The attacks were accompanied by some nausea and vomiting. Drosin also reported the presence of colicy pains in the lower right quadrant and backache for several days before a simulated period.

Complications—Abdominal distress accompanied by urgency and frequency of urination and desire for defecation may occur. The distended cavities may rupture into the bladder and a vesico-vaginal fistula develop. The rectum may be perforated and a rectovaginal fistula result. According to Belson rupture has occurred through the labia majora. The hymen itself may give way and rupture occur at the introitus. In rupture of any of these areas the sinus may persist or may be inadequate and the condition may recur. The retained fluids may be forced through the tubes into the peritoneal cavity with subsequent peritonitis. These cases are most serious as infection is prone to occur.

Treatment—The essential feature is the evacuation of the distended vagina, uterus and tubes. This is done by excision of the central area of the hymen. The use of the electrocautery may be valuable in the reduction of bleeding along the margins and decrease the number of sutures necessary to control bleeding. Lazarus called attention to the value of a radical excision of the hymen to prevent subsequent closure of the opening. Some surgeons advise careful closure of the raw surfaces with plain catgut to prevent stricture and recurrence. Throughout any of the procedures the usual aseptic operating room technique is followed, always cognizant of the serious complications of infection. The importance of radical excision of the hymen is indicated by the fact that it has been necessary to reopen incised hymens, sometimes more than once. Bowyer after reoperating several times used pure carbolic acid to cauterize the wound edges and they remained open. Pyosalpinx and peritonitis are not unknown following this operation. Vaginal packs and irrigations are potential causes of infection and are contra-indicated. Elliott treatments by rectum may aid in the absorption of the contained menstrual debris. They should not be given by vagina.

The thick tarry, chocolate colored fluid varies from a few hundred centimeters to several liters. The hymen may require opening before the onset of the menses in order to evacuate retained non-hemorrhagic secretions.

Belson advocates a radical hysterectomy, removing the tubes, if a tubal tumor is present, thus removing all potentially infected organs. In his opinion, the dangers of infection are a real hazzard and conservatism is unwarranted. He further advocates drainage in all cases for the same reason.

Prognosis—Once the tubes are distended there is little hope of their functioning, hence most of these patients are sterile. Kotz reported a case which had a doughy pelvic mass six months after operation. The abdomen was flat, but the pelvic organs were not distinguishable. The menstrual periods had been regular. The vagina post-operatively may be unusually deep. Endometriosis may have occurred before the tubes were sealed and all the pelvic organs may be caught in an adhesive mass.

Searle reported a case of a woman married fourteen years. Neither she nor her husband realized that intercourse had been other than normal. She consulted her physician because of difficulty in micturition of two years duration. A large tender mass arising from the pelvis and extending half-way between the umbilicus and ensiform cartilage was found. This was found to be a hematocolpos and nearly four pints of tarry fluid were evacuated. She was seen four years later when she was five months pregnant. The vagina at that time was about the size of a nulliparous woman.

CASE REPORT

The case to be reported is that of an eighteen year old girl who was first seen at the Clinic on August 4, 1939. She came in for an employment examina-

tion and had no complaints in answer to the routine questions. Her mother died of carcinoma of the breast at the age of forty-eight. Her father and only brother were living and well. As a child she had measles, chicken-pox, whooping cough and pneumonia. She had a tonsillectomy at seven years of age

On questioning regarding her menstrual history the girl stated that she had never menstruated. That about a year previously she had sought medical advice because of lack of menses, and, without examination, was given some medicine. Further questioning then revealed that for about one month she had had some pain on urination and noticed that her abdomen was becoming increasingly hard.

A catherized specimen of urine was negative for albumin and sugar. There were 3 to 5 white blood cells per high power field, but no erythrocytes were found. There were 4,060,000 erythrocytes and 8,200 leucocytes per cubic millimeter of blood. The hemoglobin was 79.4%. The blood coagulation time was five minutes.

Her physical examination was essentially negative except for the abdomen and genitalia. The breasts and hair distribution were normal for her age. The blood pressure was 115 millimeters of mercury, systolic, and 80 millimeters of mercury, diastolic. The liver and spleen were not palpable. There was a large tumor mass in the lower abdomen which extended two fingers above the umbilicus. This mass was firm, symmetrical, smooth and fluctuant, and suggested a pregnancy. There was no abdominal tenderness.

Examination of the genitalia showed an intact hymen which was bulging between the labia. A bimanual rectal examination revealed that the pelvis was practically entirely filled with the mass and that it was associated with the vagina and uterus.

The patient was advised to have a hymenectomy and was admitted to the hospital on August 5, 1939. Under nitrous oxide anesthesia examination showed a bulging oval mass protruding from between the separated labia. This mass was about the size of a six month's pregnancy, filling the pelvis and extending above the umbilicus. The hymen was punctured with a trocar and about twenty-five hundred cubic centimeters of thick, dark, tarry fluid was evacuated. The hymen was about one-fourth of an inch thick. Sufficient hymen was then excised to admit three fingers and three penrose cigarette drains were inserted. It was necesary to clamp and tie several blood vessels. The vagina was not irrigated. The drains were removed in forty-eight hours. The postoperative course was uneventful and she left the hospital on August 7, 1939.

A progressively decreasing amount of drainage continued for six weeks, when it became thin and grayish. At this time a rectal examination revealed a thickened, movable, boggy, retroverted uterus. The patient was instructed to take a soda douche once daily and to take exercises to bring the uterus forward. On October 2, 1939, she had what was apparently a normal menstrual period lasting four days. There was no discomfort during the period. An examination on October 31, 1939, revealed the uterus to be about three times normal size. The vaginal introitus would admit one finger easily. The cervix was thickened and soft, and elongated transversely. The uterus was in a satisfactory position, freely movable and anteflexed. A subsequent check-up on January 27, 1940, showed very little change in the size of the uterus. The vaginal introitus still admitted a finger and the discharge had practically ceased. Menses had continued at four week intervals, lasting four to five days with a normal amount of flow, when she was last heard from on April 17, 1940.

SUMMARY

1. A case of imperforate hymen in an eighteen year old girl is reported.
2. A brief discussion of the pathology, signs and symptoms is given.
3. The importance of wide excision of the hymen to prevent recurrence is stressed.

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THE PRESENT STATUS OF PRACTICAL ENDOCRINE THERAPY

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Introduction: For the past few years a number of crystalline compounds and highly purified extracts have been available for therapy in enodcrine conditions. With the advent of such substances, preparations of desiccated glands excluding thyroid or simple extracts of these, have fallen into increasing disuse. There is no justification for prescribing such products whose physiologic activity is insignificant or unknown when physicians may conveniently employ highly active preparations whose properties have been thoroughly investigated in the laboratory and clinic.

In the time allotted me it is obvious that I will be unable to cover in detail the basis for the therapeutic application of these newer preparations or to attempt to explain the reasons for therapeutic failures. I will, therefore, sketch the "high spots" only in the newer endocrine therapy as it applies to routine practice.

Anterior Pituitary: In regards to preparations of the anterior lobe of the pituitary, I will make a broad statement in saying that their use is, on the whole, disappointing. In the first place, sufficiently potent preparations are not available due to the difficulty and expense in processing and deriving a preparation whose potency would be theoretically capable of producing a therapeutic response. For example, the treatment of pituitary dwarfism with growth hormone preparations is, as a rule, discouraging except in instances where special high potency noncommercial extracts are used. The pituitary gonadotropic hormone preparations on the market have, according to the available evidence, little or no effect on the human ovary. The lactogenic hormone preparations are, on the other hand, apparently of some value in stimulating the flow of milk. There are few clinical reports on this subject. Preparations of the anterior lobe containing many factors or so-called "soup" are of distinctly questionable value. One should realize that anterior lobe preparations lose much of their activity on standing in aqueous solution.

Gonadotropic Substances: The gonadotropins most commonly used in endocrine practice are not derived from the pituitary but are obtained from the urine or placenta or pregnant women and from the serum of pregnant mares. The former, or chorionic gonadotropin, has been prepared in relatively pure form. Preparations are assayed according to an international standard powder. The Council on Pharmacy and Chemistry has recognized that this substance is of definite value in the treatment of cryptorchidism where there is no anatomical barrier which might prevent the descent of the testes. In treating cryptorchidism in boys it is advisable to differentiate between a true functional retention and the reflex spasm of so-called pseudocryptorchidism. Chorionic gonadotropin has been used in large quantites in the treatment of functional uterine bleeding, but it is now recognized by authorities that such therapy is indeed of doubtful value. It has been certainly shown that this substance is incapable of stimulating either the monkey or the human ovary. Long continued administration of chorionic gonadotropin may actually damage the human ovary. The following additional conditions have been treated with chorionic gonadotropin with doubtful results: abnormal spermatogenesis, dysmenorrhea, migraine, acne, amenorrhea and other menstrual irregularities, obesity and frigidity. There is no apparent rationale for the use of chorionic gonadotropin in these conditions.

The gonadotropic substance from the serum of pregnant mares equine gonadotropin has been on the market for a number of years in a relatively potent form. The scientific reports on this substance indicate that little benefit is derived from its use. Although it has been demonstrated fairly satisfactory that ovulation in the human may be produced by administration

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of equine gonadotropin, there is no reason to believe that any but a normal woman who ovulates spontaneously will respond to equine gonadothopin. Its use in sterility is, therefore, questionable. Its use in ovarian dysfunctions is difficult to evaluate and in all probability, according to the available evidence, not practical. There is some evidence that it may stimulate spermatogenesis. Its use in the treatment of cryptorchidism is not as satisfactory as that with chorionic gonadotropin.

Estrogens: One of the high points of modern endocrine therapy has been the development of pure, potent estrogens for use in several conditions. There are several types of estrogenic preparations on the market at the present time. There are the natural estrogens which may be in crystalline form such as estrone, estriol, estradiol and its compounds and the noncrystalline estrogens which are in effect highly purified extracts of urine obtained from pregnant mares and humans. Recently synthetic compounds have been prepared which are highly potent estrogens with most of the characteristics, biological and therapeutic, of the natural estrogens.

The problem of choosing a satisfactory estrogen for therapeutic purposes is indeed confusing. Claims for superiority of one estrogen over another have been frequently made by pharmaceutical firms. Such claims are, as a rule, based on data obtained from laboratory animals. Bioassays of estrogens by different investigators vary tremendously and there may be as much as 1,000 per cent difference in a rat unit as determined by different laboratories. The assumptions concerning the comparative therapeutic effectiveness of estrogens made on the basis of laboratory data are therefore unsafe. It is becoming quite clear that the only worthwhile estrogen assay for therapeutic effectiveness is that obtained in the human as determined by the therapeutic response and made on the basis of weight of estrogens rather than biological units. When such a comparison is made of the various estrogens in a large number of women, we will then have a reliable measure of the therapeutic efficiency of these estrogens.

In the past several years synthetic estrogens have become available for clinical trials. The one which has received the widest use is diethylstilbestrol or, as it is commonly known, stilbestrol. This is several times more potent than estrone in the rat. A remarkable property possessed by stilbestrol is its relatively high degree of activity when administered by mouth. Furthermore, it is inexpensive to prepare, compared to the natural estrogens. In dosages of 0.5 to 1 mg. a day it will relieve the menopausal symptoms of a majority of patients. The main disadvantage in using stilbestrol is the development of certain unpleasant symptoms in about 10 to 20 per cent of the cases. These symptoms consist chiefly of nausea and vomiting, headache and dizziness. There has been no adequate demonstration that these symptoms are due to tissue damage. In my opinion, the symptoms result from a systemic reaction to estrogens similar to that which occurs in early pregnancy when estrogens are likewise circulating in the tissue fluid of the woman. It is not unlikely that the systemic reactions are due to tissue edema from changes in electrolyte balance; thus nausea is explained by edema of the gut and the headache by edema of the brain. Another synthetic compound, hexestrol, is closely related to stilbestrol. It is claimed in England that it is as active as stilbestrol but less toxic. In my experience it is about one-fifth as effective therapeutically as stilbestrol and probably less toxic. Other synthetic compounds are being investigated at present. It is practically certain that physicians will soon have available highly potent, orally active estrogens which will not place an undue economic strain on the patient.

Much of the estrogen therapy has been abused and has been the subject of hit-and-miss, trial-and-error tactics. Estrogens are undoubtedly of the greatest value in the treatment of the menopause and complications of the menopause such as senile vaginitis and kruarosis. They are also of value in gonorrheal vaginitis of children. In the treatment of ovarian dysfunctions there have been large numbers of papers containing variable data on the use of estrogens. It is difficult to discuss briefly the use of estrogens in ovarian disorders since there is no uniform procedure in treating these conditions as almost every investigator has his own method. In the treatment of amenorrhea, estrogens may be administered to induce uterine bleeding. This usually requires relatively large

doses, in the neighborhood of 10 to 30 mg. of estrogenic substance. This therapy must be repeated in courses in order to produce cyclic bleeding. Most patients cease having these menstrual cycles after the estrogens are withdrawn. Whether or not it is worthwhile to induce bleeding in patients with amenorrhea depends to a great extent on the desire of the patient. For psychic reasons only, therefore, does it appear worthwhile to use estrogens in amenorrhea. A few patients with functional amenorrhea may continue to have regular cycles after cessation of therapy. This type of therapy has been called "shaking the clock." The use of synthetic estrogens may more conveniently permit such therapy, since large amounts may be administered orally at relatively little expense. In the treatment of dysmenorrhea, estrogens have been used successfully to a limited extent. These should be administered in the first two weeks of the cycle in order to completely or partially suppress ovulation. Such treatment is usually temporary and repeated courses of therapy may be necessary. Dysmenorrhea, due to the so-called infantile uterus, is a doubtful entity since it has been shown rather satisfactorily that functional dysmenorrhea occurs as a rule where there has been an ovulation and this indicates a normal reproductive apparatus. In the treatment of meno-metrorrhagia, the estrogens are being used with some success of late. This has been due to the fact that some of the newer estrogens can be obtained in high potency dosage forms, and doses required for the suppression of bleeding are rather large in comparison with the amounts usually administered in the treatment of the menopause. Occasionally relatively small amounts may be effective, such cases being those of excessive bleeding in women approaching the menopause. A rather interesting development in the treatment of uterine bleeding is the injection of estrogens in oil directly into the cervix with practically immediate control of the bleeding. Stilbestrol and estradiol compounds have been used for this purpose. Estrogens have also been used in the suppression of lactation with good results. The best results have been obtained in the early postpartum period where the administration of 10 to 20 mg. of estrogen daily for two to three days will suppress or delay lactation and prevent mammary engorgement. The use of estrogens in weaning may be of some value in relieving the patient of her distress due to mammary engorgement.

Estrogens have been used for a large number of unrelated conditions. The list of such conditions are encyclopedic in scope and I will be unable to discuss the unscientific nature of much of this therapy. There are a number of conditions, however, which are the subjects of experimental investigation at the present time but I will refrain from discussing this work.

I would like to mention the use of implants of crystals or pellets of estrogens. By placing 25 to 50 mg. of estrogen in crystals or pellet form in subcutaneous pocket, menopausal symptoms may be relieved for many months without supplementary therapy because of the retarded rate of absorption of the bulky material. A modification of this technic is possible with the new preparation of estrone crystals which my associates and I have introduced. This preparation is injected with a syringe; the water is taken up rapidly by the tissues leaving a deposit of crystals to be absorbed slowly giving a prolonged therapeutic response. Injections of diethylstilbesterol defalmitale will also control symptoms for many weeks as I and my associates have recently reported.

Progesterone: Progesterone, the corpus luteum hormone, is obtained from ovaries or by chemical synthesis of certain steroids. The therapeutic use of progesterone has been, on the whole, a disappointment. At first it was considered that progesterone would be ideal in the treatment of functional uterine bleeding, dysmenorrhea and habitual abortion. The evaluation of the evidence in the literature indicates that it is of little value in the treatment of ovarian dysfunctions. It is helpful in relieving premenstrual tension and it is of possible value in the treatment of habitual abortion. In the latter case it is indeed difficult to evaluate the efficacy of any agent and for this reason numerous preparations have been considered worthwhile. There appears to be evidence, however, that in many cases of habitual abortion the patient has a progesterone deficiency, and on this basis progesterone may be indicated in

such cases. A compound called pregneninolone, which has progestational activity when administered by mouth, has been available commercially for over a year. This "oral progestin" is one-fifth as active by mouth as progesterone by injection. Inasmuch as progesterone is of such limited value, it can be seen that the use of pregneninolone is open to question. There have been a few reports on the beneficial use of pregneninolone in the treatment of habitual abortion, but such results require confirmation. In the treatment of ovarian dysfunctions, pregneninolone is of doubtful value.

Testosterone: The most efficient androgen for therapeutic purposes is testosterone propionate. Preparations of testicular tissue or androsterone are practically worthless. Testosterone is of distinct value in the substitution therapy of eunuchoid or castrate men. The dosages required for satisfactory effects are from 60 to 150 mg. per week. The symptoms and signs of castration return with cessation of therapy. The androgen treatment of functional cryptorchidism has few advantages, nor has it any but psychic value in treating senility, psychic impotence or impotence due to other than organic causes. It should not be used for treating disorders of sperm formation since it actually suppresses spermatogenesis.

Testosterone propionate may induce symptomatic relief in cases of prostatism but has no effect on the anatomic structure of the prostate. This substance has been used in certain ovarian dysfunctions such as dysmenorrhea, menorrhagia, painful breasts and premenstrual tension. It may be of value in some of these conditions, at least temporarily, but usually the amounts required are rather large, 100 to 500 mg. per month. An oral preparation of testosterone is available in the form of methyl testosterone. Four times as much of this compound by mouth is required in order to induce the effects obtained with testoster one propionate by injection. The economic aspects of such therapy should therefore be examined closely. These androgens exert their effects by percutaneous administration. The ointments of testosterone propionate and methyl testosterone now on the market are definitely of insufficient strength to induce any satisfactory clinical response other than that from suggestion.

Adrenal Cortex: Effective preparations of the adrenal cortex are obtained only from a relatively large amount of glandular material, that is, about 1 c.c. of extract should be equivalent to about 51 grams of gland. Adrenal cortex extracts are of value in the treatment of Addison's disease. It is quite doubtful as to whether these extracts are worthwhile in treating so-called borderline cases of adrenal insufficiency such as asthenia and toxemias. Preparations of the adrenal cortex for oral administration are theoretically effective, but it has been definitely shown that in order to obtain a good clinical response, relatively huge amounts of the best oral preparations are required and this is certainly not within the reach of most patients.

Desoxycorticosterone acetate, a synthetic steroid, is effective in the treatment of Addison's disease, but caution should be observed inasmuch as overdosage may result in hypertension or even heart failure. Its use in the treatment of the borderline cases of adrenal insufficiency is also open to question. The use of adrenal cortex preparations in the treatment of shock is being investigated vigorously at the present time. It is possible that in the near future we will have more information regarding the treatment of surgical or medical shock by such hormone preparations, since this therapy is in the early experimental phase and additional evidence is awaited.

CONCLUSION

When the indications are proper, one may obtain gratifying responses with endocrine preparations, but it is too much to expect that they will be of value in the multitude of indiscriminate conditions for which they have been used. The discouragement of many physicians with endocrine therapy is due mainly to the employment of endocrine products in conditions for which there is no sound basis. If physicians will adhere to scientific principles of endocrine therapy, this situation will be satisfactorily remedied.

The recent progress in the development of crystalline endocrine compounds is most promising, especially when it is realized that certain synthetic substances may actually be superior to those obtained from natural sources.

55 E. Washington St.

AMERICAN SOLDIER IS BEST FED FIGHTING MAN IN WORLD TODAY

In an outline of the Army's nutritional problems, James A. Tobey, Dr. P. H., Lieutenant Colonel, Sanitary Corps Reserve, United States Army, New York, in the current issue of War Medicine, published by the American Medical Association in cooperation with the Division of Medical Sciences of the National Research Council, declares that "For an army of 1,500,000 men, nearly 9,000,000 pounds of food must be procured, transported, stored, supplied and prepared every day, the biggest catering job in the history of this country. With the expansion of the Army, this task will gradually become even greater." He explains that in camps and posts the American soldier eats about 5 pounds of food a day, or somewhat over 1,800 pounds a year whereas in the civilian population the average consumption of food is about 1,400 pounds a year.

Pointing out that good nutrition is a military necessity, Colonel Tobey says that "the American soldier can be, and generally is, the best fed fighting man in the world today. There is available to him an abundance of wholesome natural foods, and his menus are carefully selected and arranged by dietary experts who are thoroughly familiar with the newer knowledge of nutrition. . . .

"The fare of the American soldier is, in general, much superior to that of the Nazi and the Japanese soldier. Because of the shortage in natural foods, the Nazis depend in considerable measure on *Ersatz,* or substitute, foods, such as concentrates of soy bean flour mixed with dried vegetables and fruits. These concoctions are nourishing but not particularly appetizing. The Japanese subsist largely on polished rice, with soy beans, root vegetables and a little fish. Staple foods common in America, such as bread, meat, milk and fruits, are almost totally lacking in the Japanese diet, although the military forces receive better rations than does the general populace. . . ."

Colonel Tobey explains that while the procurement of food and its supply to troops is the function of the Quartermaster Corps, supervision of the nutrition of the soldier is the legal responsibility of the Medical Department of the Army.

Explaining that the basis of the field ration, which last year replaced the old garrison ration system for troops in this country, is a monthly menu prescribed for stations within a corps area, he said that a most significant statement in the order creating the new ration is that " 'Care will be exercised to see that the menu is nutritionally balanced, ample variety provided, and full utilization made of seasonal fresh fruits and vegetables.' Apparently this is the first time in the history of the Army that stress has been placed on the nutritional adequacy of the diet, a natural development, however, in view of the modern progress of nutritional science."

Regarding nutritional standards in the Army, Colonel Tobey says that each soldier needs at least thirty-six essential nutrients in his diet.

"The soldier," he says, "can obtain all of these necessary nutrients if at least 60 per cent of his calories, or units of food energy, are furnished by such protective and body-building foods as pasteurized milk and other dairy products, eggs, fruits, green leafy vegetables, yellow vegetables, meats and enriched bread and whole grain cereal products. The remainder of his calories will be secured from energy-bearing foods, such as breadstuffs, potatoes, solid vegetables, fats and sugar. He will derive full benefit from these foods only if they are properly prepard, without loss or reduction of essential vitamins and minerals."

On February 10, 1942, it was announced that all bread used by the Army would be prepared from enriched flour.

Explaining that during combat and in certain situations, such as aviation activities, parachute work, tank maneuvers and mobile operations at long distances from bases, special rations are often necessary, the Colonel said that concentrated foods packed in special containers have been devised for these purposes.

SEARLE COMPANY ENLARGES EXECUTIVE STAFF

G. D. Searle & Co., scientific pharmaceutical manufacturers of Chicago has added Franklin P. O'Brien to its executive staff. John G. Searle, President, announces Mr. O'Brien will act as Mr. Searle's executive assistant.

The new Searle Research Laboratories, now located in Skokie, Illinois were recently opened to public and Army and Navy inspection at an all-day reception.

Clinicopathologic Conferences

J. J. Moore, M.D., Department Editor.

PRESENTATION OF CASES BY

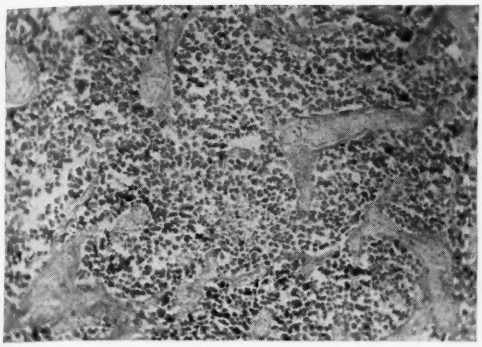
B. Markowitz, M. D.
Brokaw Hospital
BLOOMINGTON

CASE 1 — MULTIPLE PRIMARY MALIGNANCIES

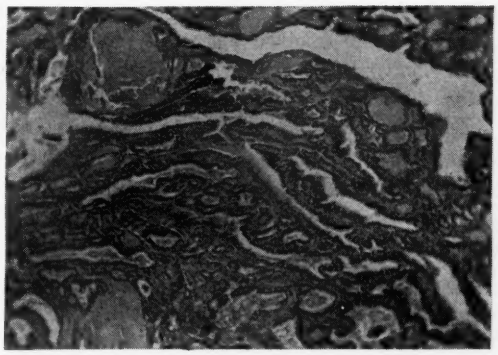
Dr. S. J. Huerta: — This 44 years old female, unmarried, was admitted to the hospital with a history of having fallen out of bed several days previously. She was stuporous and the history was obtained from a relative; she had been feebleminded since birth; had chorea as a child and developed epileptic attacks at the age of 25 which occured quite regularly until the present illness. Four years ago she complained of a painful nodule in the left breast of year duration. There was a slight discharge from the nipple and she had lost about 20 pounds in weight. She was admitted to surgery and a radical left mastectomy was performed. The anatomic diagnosis was acinar carcinoma. She made an uneventful surgical recovery and was discharged in three weeks. One year later she was re-admitted with symptoms of thyro toxicosis. At this time the left lobe of the thyroid was firm and nodular. There was a fine tremor of the tongue and coarse tremors of extended hands and fingers. The temperature, pulse and respirations were normal. X-ray of the chest was negative. No evidence of breast metastasis was demonstrable and she was subjected to a thyroidectomy. The anatomic diognosis on removed thyroid was adeno-carcinoma. Again she made an uneventful recovery and was discharged from the hospital on the 18th day. From then to her present illness there were no specific complaints except for headache and chills two days before entry at which time she was put at bed rest.

Physical examination revealed a fairly well developed, poorly nourished white female in a stupor. Chest examination revealed absence of breath sounds in the left lower chest with moist rales on the right side. The abdominal examination was negative. Her respirations were shallow and numbered 32. The temperature was 103 and the pulse 135. The red count was 3,500,000, the white count 12,000 with 80% polymorphonuclears. The urine was essentially negative. She grew steadily weaker, her breathing became very shallow and she expired four days after entry.

Dr. B. Markowitz: — On post mortem examination the essential findings were left lobar pneumonia and carcinoma of the left ovary with metastasis to the abdominal lymph glands. The left ovary, you will note, is replaced by this large rounded tumor measuring 10 cm in diameter, which on microscopic section revealed a very cellular picture. We refer to this type of tumor as embryonal cell carcinoma. The right ovary was the site of a smaller but similar tumor nodule measuring only two cm in diameter and presenting the same microscopic picture. There was no evidence of recurrence of either of the 2 malignancies found during life, and a section of the thyroid, you



Case 1. Figure 1. Embryonal cell carcinoma of ovary.



Case 1. Figure 2. Papillary Adeno-carcinoma of thyroid.

will note, is of an adeno-carcinoma type, entirely different from that seen in the ovary.

DISCUSSION

This case is of interest, first, because of three separate malignancies. Many multiple malignancies have been reported but triple cancers are relatively rare. Exclusion of the probability that one tumor is a metastasis rather than a separate malignancy is sometimes difficult. Multiple malignancies in breasts are open to criticism because of this probability; similarly, in cases where primary gastric and ovarian cancers are reported the question of metastasis arises because of the frequent spread of gastric carcinoma to ovaries. Multiple ovarian tumors too are questionable because of the difficulty in differentiating between the primary origin and the metastasis. In this case you will note the different pictures presented by the different tissues and their respective slides. That of the breast is the usual acinar carcinoma referred to as carcinoma simplex. This type comprises about 70 to 75% of all breast cancers. That of the thyroid is a papillary adeno-carcinoma while the ovary presents a very cellular picture which we reported as an embryonal cell carcinoma. There is no similarity whatever between these different tumors. Secondly, despite the history of illness since birth, epileptic attacks since the age of 25, this patient survived two carcinomas noted during life and one found at post mortem, to die of pneumonia at the age of 44.

CASE 2 — DIABETES WITH MARKED ARTERIO-SCLEROSIS

Dr. E. M. Stevenson: — This 52 year old female entered the hospital with a history of diabetes for 12 years with polyuria and glycosuria. Only during the past year had she complained of tenderness in the right great toe. During the past 6 months she complained of dyspnea, palpitation, precordial pain and edema of the ankles. She had been on a restricted diet but never used insulin. She had lost about 10 pounds in weight during the past 6 months. Several days before entry she injured the right great toe and since then has suffered excruiating pain. Physical examination revealed a well developed and fairly well nourished middle-aged female who complained severely of right foot pain. The heart was enlarged to the left and a systolic blow was heard at the apex. The second aortic sound was greatly accentuated. The abdomen was essentially negative. There was evidence of moderately severe generalized arterio-sclerosis; there was pitting edema of both legs and a dry gangrene of the right great toe. The blood pressure was 180/100; pulse 84; temperature 99.4.

Laboratory findings: — The urine showed no sugar or acetone but abumin was 4+ and contained many casts. The blood chemistry was high: urea nitrogen 80 mgms., urea 171 mgms., creatinine 5.8 mgms., sugar 410 mgms. The red cells numbered 4,000,000 per cmm. The white cells numbered 10,800 per cmm.

Diagnosis: — Diabetes with gangrene and hypertensive heart disease.

After the second day in the hospital the patient ceased complaining of pain, sank into a stupor, broke out in a profuse perspiration and expired on the 4th hospital day.

Dr. B. Markowitz: — The essential post mortem findings were those of arteriosclerosis and dry gangrene of the great right toe. The heart was considerably enlarged, weight 510 gms.

The aorta and coronary arteries showed mild and moderate calcified placques. The pancreas was smaller than normal, about 2/3 normal size, was very firm but otherwise showed no gross change. The kidneys weighed together 290 gms; the surface was irregular and granular and the cortex narrowed. There were several hemorrhagic erosions in the gastric mucosa extending into the small bowel.

Microscopic examination showed marked severe vascular changes in the kidney and pancreas. There were also marked severe parenchymal changes in the kidney. The other organs showed no remarkable microscopic findings.

DISCUSSION

While the diabetes is of 12 years duration and the gangrenous toe only of one year duration, it is reasonable to assume that the diabetes is of arteriosclerotic origin. This arteriosclerosis was generalized and she developed arteriosclerotic gangrene of the right foot, which became secondarily infected. The question arises — Why the history of glycosuria over a period of years with a terminal blood sugar of 410 mgms without glycosuria? It frequently occurs that in diabetes complicated by severe renal damage sugar disappears from the urine. The severe damage to the renal parenchyma in this case explains the absence of sugar and heavy albumin in the urine with very high figures for blood sugar, urea and creatinine.

Question: — How do you explain the gastro intestinal hemorrhagic erosins?

Dr. Markowitz: — These are most likely erosions that are so frequently found post mortem due to uremia. You will remember that the patient ceased complaining of pain, sank into a stupor and broke into a profuse sweat just before death. This together with the high blood levels and the character of the erosins would suggest uremia as the causitive factor. The severe renal damage and the high blood figures for the blood nitrogenous waste products substantiate this suggestion.

Question: — Would you give the cause of death as diabetic or renal.

Dr. Markowitz: — Quite definitely renal. She most likely died in a uremic coma.

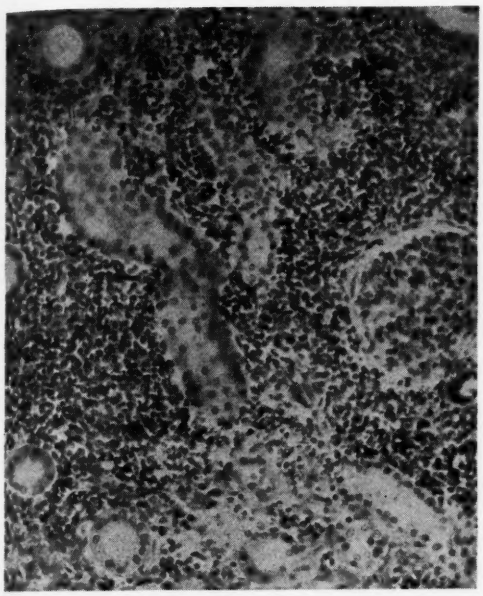
CASE 3—LYMPHATIC LEUKEMIA

Dr. Harry L. Howell: — This 70 year old male gave a complicated and bizzare history which began 6 years ago with pain in the arms and legs. There was no relief following removal of questionable teeth and subsequent tonsillectomy. From the latter he hemorrhaged severely and this dated the beginning of his present anemia. For the following four years he grew constantly weaker and had been subjected to considerable medical treatment. One year ago he visited the Mayo Clinic where the spleen was found enlarged and there was a suggestion of a large left kidney with suspected malignancy. His white count, while there, ranged from 18,000 to 30,000 and the red count from 2½ to 3 million. The differential count revealed 45 to 65% lymphocytes and a lymphatic leukemia was considered. Six months ago he developed a hematuria which persisted for several weeks and ceased. He became progressively worse and entered the hospital on a stretcher.

Physical examination presented a thin, emaciated male. The gums were pale and soft, the chest essentially negative. The spleen was markedly enlarged and slightly tender; the liver was palpable, one finger breadth below the costal margin, smooth and sharply defined. The blood pressure was 110/68, pulse 96, temperature 99.4.

Laboratory findings: — R B C — 2,400,000; W B C — 37,000; Hb 65%; differential count — Neutrophyls 30%; Lymsphocytes — 70%; no disproportion in R B C. No immature cells were noted. The urine showed a trace of albumin with an occasional red cell. Blood Kahn — negative. Blood chemistry was within normal limits. He was treated conservatively on the basis of a severe secondary anemia with a possible leukemic background. Two days before death the white cells totaled 60,000 with 88% lymphocytes a few of which were considered immature. He failed quite rapidly and expired on the 15th hospital day.

Dr. B. Markowitz: — On post mortem examination the essential findings were those of a lymphatic leukemia and severe anemia. Upon gross examination the left kidney was markedly enlarged, weight 320 gms. while the right kidney was very small, weight 60 gms. The right kidney, on section, showed a distended pelvis with more than usual fat tissue, the markings distinct, the surface pale purple-grey. The liver was large, weight 1,850 gms., the cut surface



Case 3. Figure 3. Lymphatic Leukemia — left kidney. (infiltrations compress but do not invade tubule.)

purple-grey with obscure markings. The spleen was greatly enlarged, weight 510 gms., the cut surface relatively firm and pale grey. All other organs presented a "whitish anemic" appearance. On microscopic examination the principle finding was marked leukemic infiltrations in all organs, especially the spleen, liver, kidneys and bone marrow.

DISCUSSION

An interesting phase in this case is the contracted hydro-nephrotic right kidney weighing only 60 gms with compensatory hyperplasia of left kidney weighing 320 gms which quite apparently preceded the fatal leukemia. This large kidney was apparently noted at the Mayo Clinic and associated with a progressive secondary anemia, probably suggested a kidney malignancy. The blood findings of leukemia were rather obscure and those of a progressive secondary anemia apparently over shadowed the true picture. The leukemic infiltrations found at post mortem were those of a lymphocytic type which definitely makes the diagnosis of a lymphatic leukemia. While the terms may not be well chosen we could in this case suggest a leukemic lymphatic leukemia because of the lack of the usual leukemic blood picture. A persistent high total white count with ever increasing number of lymphocytes together with the profound anemia and weakness are quite compatible with the post mortem findings of lymphatic leukemia. Most of these cases develop an acute process just prior to death at which time immature cells are usually found. I would like to call your attention to the microscopic picture of the left kidney. There are marked leukemic infiltrations which surround and even compress the tubules but do not invade them. This lack of invasion is frequently sited by those who do not believe that leukemia should be considered a malignant tumor.

Question: — Could the tonsillectomy and teeth extraction be related to the leukemia.

Dr. Markowitz: — The late Dr. Jaffe frequently called attention to leukemic changes following teeth extraction. I have seen 2 such cases both of which were of the acute type and fatal within a few months while this case went on 5 years. Yet if leukemia is an abnormal response to an outside stimulus chronicity should make no difference. If the patient just happens to have that predisposition, that is, if "the soil is proper for the seed" extraction of the teeth could lead to leukemia.

PRESCRIBING AT A COFFEE HOUSE

Dr. Radcliffe (1650-1714), the greatest practitioner of his time, was also famous as the personal physician of Queen Anne. In his relations with his royal patient he took care to maintain his professional independence. His aphorism, that there is no post more dangerous than that of personal physician to reigning princes, is apparently an expression of his experience. Dr. Radcliffe gave prescriptions to apothecaries for half a guinea (10 shillings 6 pence), i.e., for half the usual fee, in case they came to him in the evening at his coffee house. To be sure, the patients did not come along; therefore, the reduced price. When Radcliffe's favorite, Dr. Mead, succeeded his master, he likewise followed his practice of prescribing at a coffee house. He prescribed in the evening at Batson's coffee house, while in the forenoon he was to be found at Tom's coffee house in Russell Street. His fee also was a half a guinea. Mead's apothecary practice was enormous. When his personal friend and political opponent, the famous Dr. Friend, was imprisoned in the Tower for alleged political crimes, Dr. Mead took over his practice and attended to it partially from his coffee houses. When Friend was released, Mead turned over to him 11,400 guineas, that he had collected from Friend's practice.—*Ciba Symposia.*

How U. S. Army planes can photograph enemy territory at night without themselves being seen was revealed by Ernest E. Johnson of the General Electric Company in a forum address.

Photographic planes drop flares that light up the coutryside below very brilliantly for just an instant. The camera shutter in the plane is synchonized with the flash by means of a photoelectric cell. The flash is so brilliant and blinding that no one from the ground can see anything above. The plane carries home photographs that tell much more than the unaided eye could ever see.

—*Science News Letter.*

News of the State

PERSONALS · COMING EVENTS · MARRIAGES · DEATHS

The American Medical Women's Association, Inc. Branch Number Two, Chicago, Illinois has recently elected the following officers for the year 1942-1943:

President — Beulah Cushman — 25 E. Washington Street, Chicago.

1st Vice-Pres. — Emilia Giryotas — 8 S. Michigan Avenue, Chicago.

2nd Vice-Pres. — Victoire D. Lespinasse — 7 W. Madison St., Chicago.

Secretary — Helen Pisarik — 2515 Scoville Ave., Berwyn.

Treasurer — Clementine Frankowski — 1735 Atchison Ave., Whiting, Ind.

Editor Bulletin — Sadie Bay Adair — 3866 Lake Park Ave., Chicago.

President-Elect — Augusta Webster — 30 N. Michigan Avenue, Chicago.

The Morgan County Medical Society is presenting a series of five radio programs in connection with a broad program of education sponsored by the Exchange Club of Jacksonville, Illinois. The following programs have been arranged for station W. L. D. S., Jacksonville:

July 19—"The Relation of Physician and Public"—Dr. A. G. Wolfe.

July 26—"Morale"—Dr. S. N. Clark.

August 2—"Keeping Well"—Dr. Friederich Engelbach.

August 9—"The Blood Bank"—Dr. Vincent T. J. Lenth.

August 14—"Industrial Medicine"—Dr. F. A. Norris.

The Educational Committee is receiving many requests for doctors to present health talks during the coming year. The Committee is granting requests only when lay organizations can promise an audience of at least fifty adults. Copies of radio dialogues and other material will be furnished smaller groups as this material may be presented by members within the organization.

QUESTIONS ASKED BY THE PUBLIC

During the past few years many doctors have given talks on Cancer before various types of lay organizations. At some meetings an opportunity is given the audience to ask questions of the speaker and the members of the medical profession will be interested in many of these questions asked during the last few months. Mrs. A. I. Edison, Chairman of the Women's Field Army for the American Society for the Control of Cancer in Illinois, kept a list of the questions, some of which are given below:

In a throat cancer, is there any early sign visible on inside of throat?

Is it true that cancer is not inherited, but can the susceptibility to cancer be inherited?

What age is cancer most prevalent? Is it true that children may have it?

Is there ever pain where there is no lump?

Is brain tumor a form of cancer and what are the symptoms of it?

How would one know if a small tumor on the ovary became cancerous, between periodic examinations?

You say "irritation over a period of time may cause cancer". How long is this "period of time?"

Is Hodgkins Disease a form of cancer, or hereditary?

Will a removed tumor ever revert to cancer?

Can common warts on hands ever become cancerous?

Is there any truth in the statement that moles should be removed?

Are the chances of cure equally as favorable in elderly persons as in young persons?

Does a blow on any part of the body cause cancer?

Does indigestion later turn to cancer?

About fifty sets of copies of the Postgraduate papers presented at the Postgraduate Clinical Conferences are available in the office of the Educational Committee, 30 North Michigan Avenue. The price of a set is $1.00. Orders by mail will be filled promptly.

Recently the American Physicians Art Association held its fifth annual exhibition at Atlantic City, in connection with the American Medical Association convention. Illinois physicians were among the winners of the highest awards. The first prize for outstanding sculpture was a gold cup presented to Adolph M. Brown of Chicago. The award for best photography was given to Max Thorek of Chicago. Joseph S. Waldman of Belleville was awarded a medal for photography and Karl Goldhamer of Quincy was presented a cup for a pastel. The jury consisted of an outstanding group of nationally known artists.

Dr. J. L. McCormack of Bone Gap and Dr. H. L. Schaefer of West Salem were honored at a dinner meeting at West Salem on June 19th. The West Salem Rotary Club, Edwards County Medical Society and others joined together to extend honor to these two physicians who have served their communities for fifty years. Dr. Andy Hall presented each of them with the Button of the Fifty-Year Club of the Illinois State Medical Society.

Many industrial plants and large manufacturing concers have requested that the Educational Committee furnish them with sufficient copies of the "DO YOU KNOW" column for posting on all plant bulletin boards. This service can be extended to cover all plants in Illinois.

DEATHS

J. G. ALLAN, Edgewood; University of Louisville School of Medicine, 1882. Died July 8, 1942 at the age of 83 years.

SHERMAN A. ASKEW, Peoria; National Medical University, Chicago, 1907. Died June 28, 1942 at the age of 67.

WILLIAM S. HECTOR, Chicago; Rush Medical College, 1893. At one time on the surgical staff of St. Bernard's Hospital and professor of surgery at Loyola University School of Medicine. Died July 19, 1942 at the age of 54 years.

MAXIMILIAN JOHN HUBENY, Chicago; Hahnemann Medical College and Hospital, Chicago, 1906; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; certified by the American Board of Radiology; secretary of the Section on Radiology of the American Medical Association from 1923 to 1926; member of the American Roentgen Ray Society; member and past president of the Radiological Society of North America, Chicago Roentgen Society and the American College of Radiology; fellow of the American College of Physicians; professor of roentgenology and chairman of the department, Cook County Graduate School of Medicine; chief of the x-ray department, Cook County Hospital; formerly roentgenologist, Henrotin Hospital and the Municipal Tuberculosis Sanitarium; formerly editor of *Radiology*, and associate editor of the *American Journal of Cancer, Italian Journal of Radiology* and the *Cuban Journal of Radiology;* in 1931 was awarded a gold medal by the Radiological Society of North America for research; aged 61; died, July 2.

JOHN CHARLES MCMILLAN, New Berlin; Missouri Medical College, St. Louis, 1898; Died May 15, 1942, in Rocester, Minn., at the age of 68.

WALTER A. MAGUY, Chicago; Hahnemann Medical College and Hospital, 1912. Died July 18, 1942 at the age of 56.

WILLIAM J. MOLDENHAUER, Chicago; University of Illinois College of Medicine, 1906. Member of the staff of the Lutheran Deaconess Hospital. Died June 30, 1942, aged 60 years.

FRANCIS M. PAYNE, Chicago; Hospital College of Medicine, Louisville, 1922. Died of a heart attack on July 27, 1942 at the age of 60 years.

LESLIE W. SCHWAB, Chicago; University of Illinois College of Physicians and Surgeons, 1896. Attending physician and surgeon at Jackson Park Hospital. Was awarded an emeritus membership in the Illinois State Medical Society in 1938. Died July 11, 1942 at the age of 76.

LOUIS CARL SONDEL, Chicago; Loyola University School of Medicine, 1915. Visiting staff of American and Edgewater Hospital. Died of a heart attack June 17, 1942, at the age of 51 years.

FRANK E. STRICKLING, Decatur; Keokuk Medical College, College of Physicians and Surgeons, Keokuk, 1907. Served as a first lieutenant in the medical corps in the First World War. Specialist in otolaryngology for past 25 years. Died June 24, 1942 at the age of 56.

JOHN B. WICKENSIMER, Steger; Chicago College of Medicine and Surgery, 1913. Died June 18, 1942 at the age of 54.

CHARLES WALTER WINNE, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; aged 65; died, April 8.

CHARLES EDWARD WINDELER, Chicago; Medical College of Ohio, Cincinnati, 1900; aged 64; died, May 9, of organic heart disease.

INTOLERANCE TO DIETHYLSTILBESTROL

Nausea and vomiting have been the most frequent side-effects following administration of Stilbesterol (diethylstilbestrol). A recent report (*Jour. A. M. A.*, 119:400, May 30, 1942) points out that there is a definite relation between these symptoms and the nausea and vomiting of early pregnancy. If one will merely take the time to ask the prospective patient if she had nausea and vomiting with a previous pregnancy, it would serve as a warning to give not over 0.25 mg. daily as an initial dose. Desensitization may be accomplished by giving 0.1 mg. tablets once daily for five days, then increasing the dose gradually until the therapeutic level is reached. Diethylstilbestrol, Lilly (formerly known as Stilbestrol) is available in 0.1 mg. tablets, as well as in larger doses, for oral administration.

DIVIDENDS IN MAN POWER

A very considerable part of our fighting and productive force is the direct result of reduced mortality since the beginning of the century; and this in turn is to be credited to our organized public health effort and the remarkable advances of medical science in past decades. This effort has saved millions of babies, children, and young adults, so that now the numbers available for the fighting forces to defend the country, and for production in factory and field, are much larger than would have been possible under health conditions prevailing among us 40 years ago.

To obtain a numerical measure of what the improvement in our health conditions means in terms of man power, an estimate was made of the number of men of draft age present among us today, who owe their existence to the improvement in mortality since the beginning of the century. Taking into account on the one hand the survival rates which actually operated in the intervening years, and on the other the survival rates that prevailed at the beginning of the century (when men now 40 years old were born) it is found that 11 per cent of men between the ages 20 and 44 are among us simply because of improvement in mortality experienced since 1900. *Reprinted from Statistical Bulletin, Metropolitan Life Insurance Company, February, 1942.*

The hardships of war, its unhealthy crowding together of men, furnish ideal breeding ground for the spread of infection. Hence the paramount importance of preventing the enlistment of any individual who is an actual or potential carrier of tuberculosis. This statement bears equal weight in regard to those large civilian concentrations which develop under the stimulus of war industry. In these two spheres preventive measures are imperative. Total defense will not permit us to neglect them. It may be admitted that any army fights on its stomach, but it fights on its lungs and heart as well. Impair these and food alone will not compensate for the loss. Kendall Emerson, M. D.

During the first two years of the war (England) deaths from tuberculosis increased in Glasgow about 41 per cent. The 1941 record shows no improvement. Overwork, strain, ill-spent leisure are thought to be responsible for the rise.—S. LAIDLAW, M. D., and D. MACFARLANE, M. D., *British Med. Jour., Sept.*, 1941.